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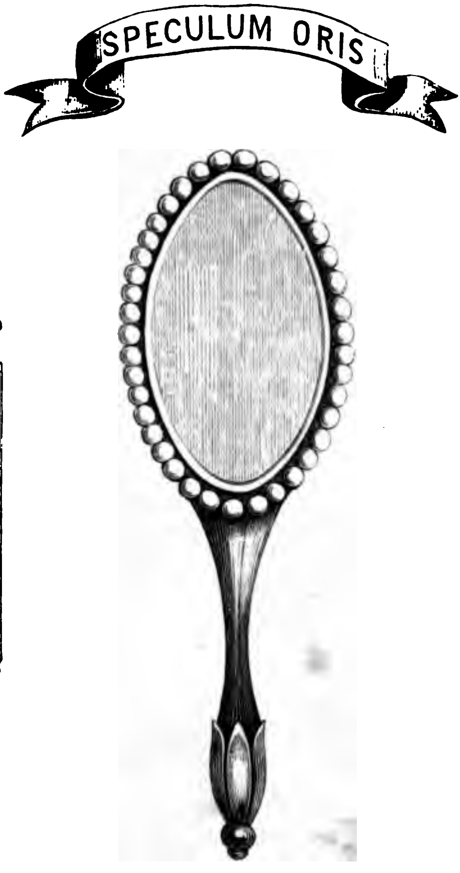
AN ESSAY
ON
THE TEETH,
BY
THOMAS LUKYN,
DENTIST.

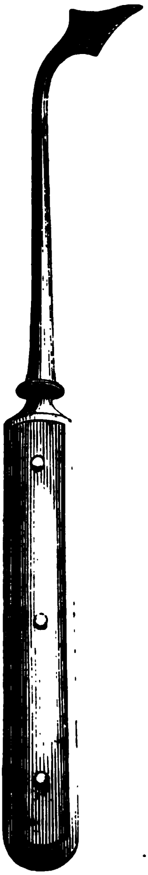
DENTISTRY,

BY

THOMAS LUKYN.

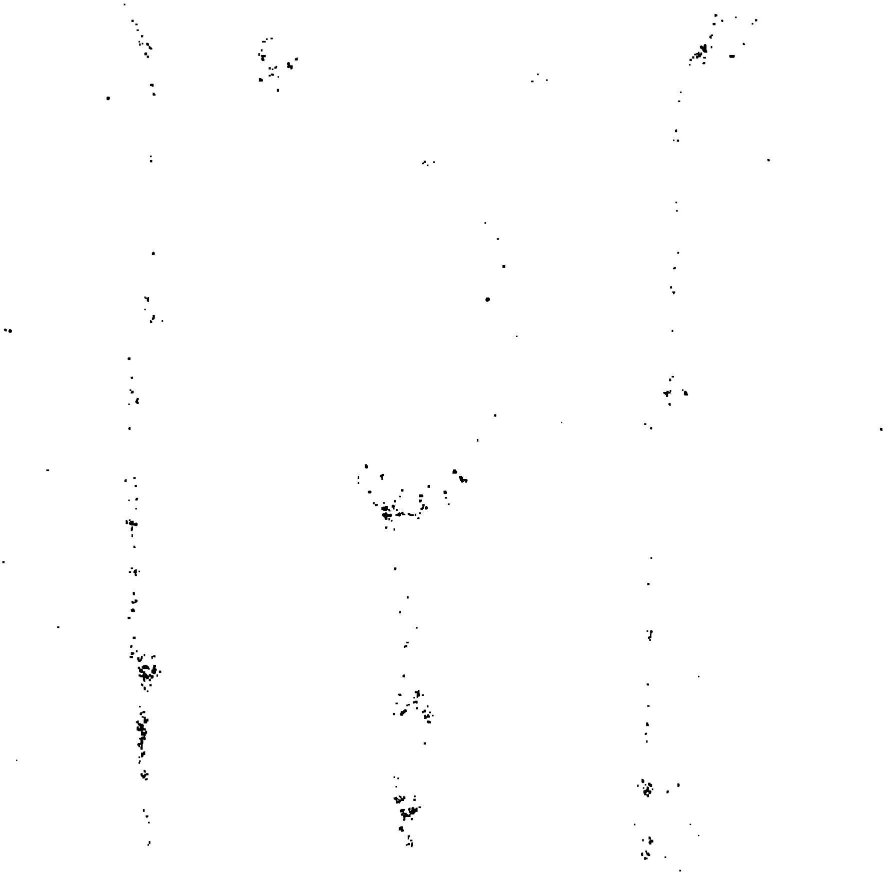
SILVER PROBE





FOR SCALING.

The above are employed to ascertain the state of the teeth. What the stethoscope is to the physician, to discover diseases of the chest by the ear, the SPECULUM ORIS is to the dentist, to discover diseases of the mouth by the eye, rendering concealed caries autoptical. Hence, when the teeth are merely examined, the speculum is indispensable.



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AN ESSAY

ON THE

TEETH AND DENTAL PRACTICE.

BY

THOMAS LUKYN,

52, UPPER GEORGE STREET, PORTMAN SQUARE.

"Those desirous of becoming acquainted with the subject, will find in this Essay much useful information for their guidance."—*Portfolio, No.* 34.

" Avec de mauvais dents jamais femme n'était belle,
Avec de jolis dents jamais femme n'était laide.—*J. J. Rousseau.*

This Edition

IS REVISED, CORRECTED, AND CONSIDERABLY ENLARGED, AND ILLUSTRATED WITH WOODCUTS.

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DEDICATION

TO THE

MEMBERS OF THE MEDICAL PROFESSION.

Gentlemen,

It is with infinite satisfaction I take this opportunity to dedicate to your honourable board this "Essay on the Teeth and Dental Practice," because I feel I am dedicating it to men whose acquaintance with the human frame entitles them to be acknowledged judges of the best modes of remedying and supplying the deficiences of any of our organs: and, gentlemen, I have tried to render these pages worthy of your patronage. Feeling, however, that a very partial success has followed my endeavours, as well as on account of the nature of the subject, I must continue to rely more upon your kind consideration, than on the intrinsic merits of the work itself.

I remain, with the greatest respect,
Gentlemen,
Your most obedient servant,
THOMAS LUKYN.

52, Upper George Street,
Portman Square.

INTRODUCTION.

THE arrangement I have adopted, will be found to differ from that of other dentist writers, treating upon this subject. They have usually commenced with the physical structure of the mouth and teeth of infants, children, and adults, then proceeded to the operative part, and lastly to the mechanical portion of it. I have thought it better to begin with the artificial branch of the subject, because it is more required in my practice, and it is the branch I was articled to for seven years, and in which I have been engaged ever since.

It is proper to inform my readers, that at this time there is a prevalent desire in the fashionable world, to employ the French mode of constructing and fixing teeth; and I beg to say, my work more particularly than any others, has been in the French mode of mechanical construction and improvement. Numerous opportunities have been afforded me of working in the French way, by which I am enabled to offer my experience to the public, and to distinguish, in any particular case, what it is best to recommend a patient. It must nevertheless be borne in mind, their work is rather slighter than the English, it is consequently not so heavy, and decidedly less costly. There is a difference in the people of the two nations,—in the language and diet, requiring artificial work, adapted to each. The French language is spoken with rapidity and energy, and ours, in a slow deliberate manner; again, the Cuisine Française, and that of the Cuisine Anglaise, as regards the using of teeth, differ; the food of the former is rendered soft and tender, the latter often hard and difficult of mastication, hence it is, that slighter work would suit better the one, than the other. I endeavour, in constructing my artificial pieces, so to combine the French and English modes, that they shall have the lightness of the one, with the strength and durability of the other.

The public is now pretty well aware that of late years, human teeth have been superseded by various substitutes. I shall not here discuss the advantage of one sort, over another; only observing, that any substitute is preferable to the employment of natural teeth; and it is quite wonderful how well artificial teeth, cleverly adjusted, will fulfil the functions, of the natural ones.

Fox, Cartwright, Hunter, Bell, Waite, and other eminent men, have been studied, and their views are still entertained, where they have not been superseded by the more recent improvements; for there have been many of late years, and in no branches of scientific mechanism have there been more than in mechanical dentistry. Where the art is exercised with adroitness and skill, there are very few cases but what can be treated with signal success, and in which artificial teeth may not be made to perform all that can be reasonably required of them.

THE ESSAY
IS DIVIDED INTO THREE PARTS,
WITH
Introduction and Preliminary Remarks.

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AN ESSAY ON THE TEETH.

PRELIMINARY REMARKS.

In the performances of the dentist, two parties are

ERRATUM.

Page 39, last line, for "Under" ditto *read* "Upper" ditto.

stage of my proceedings, to be scrupulously particular, and to point out my reasons, so that my particularity may not appear singular or tedious. Then the patient being informed what his individual case requires, the thing proceeds, being mutually understood; and I am happy to say, I hardly know an instance, in which I have not, by suiting my mechanism to the circumstances that have presented, given perfect satisfaction. In many cases, I have succeeded where others have failed;—I do not wish to arrogate to myself superior skill; but I

AN ESSAY ON THE TEETH.

PRELIMINARY REMARKS.

In the performances of the dentist, two parties are engaged; and on the assistance afforded him by the patient's firmness, and yielding a confident compliance to what the operator requires, the ultimate success in the future stages of the artificial work mainly depends; for any error transferred by the first impression, will be continued to the end of the piece to be produced, and never afterwards can be rightly corrected. I endeavour, therefore, on all occasions, in this first stage of my proceedings, to be scrupulously particucular, and to point out my reasons, so that my particularity may not appear singular or tedious. Then the patient being informed what his individual case requires, the thing proceeds, being mutually understood; and I am happy to say, I hardly know an instance, in which I have not, by suiting my mechanism to the circumstances that have presented, given perfect satisfaction. In many cases, I have succeeded where others have failed;—I do not wish to arrogate to myself superior skill; but I have found, where success has been wanting, it has been owing to the work, and the fitting it to the mouth, having been performed by different persons; while in six cases out of ten, I should always recommmend that the mechanical piece, and the fitting it to the mouth, be done by the same individual.

A physician wrote to me that he had not been able to wear a few upper teeth, constructed for him by a country dentist, and that he had resorted to another, who had equally failed. I was requested to visit him in the country. He wished me to remove a stump; this I informed him, was quite unnecessary, because not the cause of the failure of the other pieces, as he had supposed. I took the impression of his mouth, returned to London, and the afternoon of the following day, sent him by train a partial set of eight teeth. In two posts I had a letter which stated that he was surprised his case had presented a difficulty, for those I sent required no alteration, but fitted him closely and comfortably. As I have stated, there should be an understanding, in the first instance, between the patient and the operator; if the former yield all the facility that can be given, for insuring a correct model to work by, the latter, I am sure, will not fail to take a good facsimile of the parts, and adjust either a whole or partial set of teeth easy and agreeable to the wearer. The qualifications of the operative and mechanical dentist are of very great importance, for, without a thorough knowledge, it is utterly impossible he can achieve what he has undertaken to perform with any satisfaction to the patient or with any credit to himself. In the present day, there are too many amateur dentists; I use this term amateur, as applying to those who have taken up the business, without any previous knowledge, having failed in some other occupation; however, this conduct soon meets with its own deserts, for failure will generally follow. The cheapness of advertised teeth attracts some; others are attracted by specimens exposed in show-glasses, got up in a tawdry and glittering manner, to draw the attention of the passer-by. But in this, as in other things, the low priced thing is seldom found to be so economical in the end, as that which is good and has commanded a fair remunerative price. A bad article is found never to wear, or to answer the purpose required. Such productions, from their cheapness may attract patients, but will never retain them.

It is very desirable that the practice of the dentist should be protected, and none permitted to exercise the calling who have not served a seven, or at least a five year's apprenticeship; for a man must learn an art or trade before he pretends to practice it, and this is most necessary in a mechanical business; and it would not be more justice to myself, and others who have served their time, than a security to the public that only capable persons were engaged. Whether the dentists as a body will ever be formed into a society, making an apprenticeship imperative, however desirable, has not yet been determined;

though the thought is seriously entertained by those we will call legitimate dentists, in contra-dis tinction to amateur. If it is expected I should make any observation on the charges of dentists, the difficulty is not easily met; for there are real and adventitious circumstances affecting charges from the dissimilarity of individual cases, some requiring time and study, and much consideration in deciding upon the best mode to adopt in each case, as it would be preposterous to suppose every person's mouth was in the same state. Every case requires the dentist's ingenuity to provide what is best suited for a patient; and if dentists are not fairly remunerated, they either produce an inferior article, or give up the pursuit. The best materials employed, and the best work, performed by an originally apprenticed workman, will always command what remuneration he can conscientiously demand, which would not be given unreluctantly by any one at all acquainted with the subject, or who may have experienced any benefit from artificial work. I am proud to assert, I have never found any one whom I have attended dissatisfied, and I could have no greater proof of this than their recommendation, and their having returned when occasion required. I cannot omit, here gratefully acknowledging the liberal support which many members standing high in the profession rendered me in my early career.

PART THE FIRST.

ARTIFICIAL TEETH IN SINGLE, PARTIAL, OR WHOLE SETS.

I NOW come to treat of the first process, in which we use wax for obtaining the model of the mouth, whether it is for a partial or an entire set of teeth; and to show how the wax is prepared to receive by impression the form and figure of the parts to be supplied.

The best yellow bees' wax should be used; and no preparation of it will do so well as the thing in its simple and natural state, and when it has been kept about eighteen months. Many attempts have been made to colour it, and mix it with other substances, for the purpose of making it pleasing to the eye, and to improve its properties for taking every rise and depression of the part to which it is applied; but these attempts in no way whatever have been found to contribute to its improvement. The wax is to be worked with the hand in hot water, and the heat makes it capable of being conformable to any shape. It is then transferred into silver receivers or shapes, which have been previously selected, as those most likely to fit the size of the mouth. The receivers, being charged with the soft wax, are introduced into the mouth, and gently pressed on the gums and existing teeth and stumps, each receiver is to remain for about a minute and a half or less, and then to be carefully removed horizontally and with great steadiness of hand. This is all the inconvenience the patient has to undergo, there is no pain of any kind attending it, and the patient is not required again till the piece is completed and ready to be worn. Some practitioners (so imperfect are their proceedings) actually subject the mouth to operations to fit and suit their work, whereas I always make my work to fit at once.

CASTING IN PLASTER OF PARIS. The purest, whitest and finest, is kept very dry for use; and for insuring its setting compactly, it is mixed in water, at summer heat, to the consistence of thick cream. It is then poured into the receivers, which contain the wax impressions, and whilst it is setting, they are to be trimmed up with a long spatula-knife, and shaped to a neat horse-shoe shape; after a few hours the plaster is separated from the wax, then exposed to a gentle heat before the fire, to dry and harden. Now having got before us the exact image of the case, we form a model for proceeding to the next stage, which is a metal casting into what is called the metallic, he and she die. Some foundry sand having been provided, the plaster model is closely imbedded in it, and on its being released from the sand, the casting metal is then poured in, fills the place which had been previously occupied by the plaster mould, and thus is called the he die. This is now divested of the casting sand, and let down into a plumber's ladle of melted lead, which constitutes the she die. Any gum plate, hereafter intended for mounting teeth upon, is previously stamped, by being placed on the he die, inserted into the other, and then struck with a heavy blow. The plate inserted between them receives every rise, and depression of the part inside the mouth which it is intended to fit, whether it is for a partial or a whole set; either must undergo the same process, for making a gold gum plate. In those cases where a gold gum plate is not used, sea horse bone supplies its place, and on this we mount the teeth. Then there is no occasion to have any metallic dies, but by carving we reduce this material so as accurately to fit the plaster model. When the natural gums have been absorbed, this mode of preparing an artificial piece is more applicable than a metal plate, though I cannot say it is quite so durable. Teeth cannot be mounted on this substance, I am sure, by any dentist who has not been engaged in this kind of work during his apprenticeship; for it never is, or never can be, effected by an amateur, or any one who has begun late in life to attempt it. I have paid considerable attention to this branch of practice, it happening, that sometimes I am engaged for a whole month together only in sea-horse bone, while, at another time, cases have come, in which gold plates are required, to answer the purpose efficiently.

Much has been said of the comparative merits of bone and gold, and dentists have not agreed in determining the point in question. An invariable adherence to either deprives the person seeking assistance, of those comforts and great advantages which the art of a skilful dentist is capable of affording. The author has important reasons for giving preference to gold. In most cases ivory, or the tusk of the hippopotamus softens by the solvent action of the saliva; and those parts of it on which the teeth are mounted, and the pins riveted, which to fit the gum are often obliged to be made so exceedingly thin as soon to loosen. Though this kind of gum socket, is admitted to be very comfortable to the wearer, the necessity of frequently renewing it, for the reasons stated above, becomes expensive. Gold may be thin, and small in size, and yet possess comfort, and infinitely more durability than ivory.

Having treated of the manner in which we have arrived at metal and bone gums, the artificial teeth, to be mounted on them, will now engage our attention.

The teeth mostly in use are the Incorrodible Enamel, known under these various names *Mineral*, *Silicious*, *Terro-Metallic*, *Indestructible* &c., &c.; and they have of late years, been brought to the greatest perfection, so much so that we supply foreign dentists with them, of every variety of shade and colour, that the teeth already existing in a patient's mouth may be matched with an exact resemblance. Foreign manufacturers have attempted to make these teeth, with their infinite variety of shades, but have not yet discovered the mode of making them. In constructing artificial teeth, utility and comfort, as well as appearance, ought to be considered by the dentist. The former refers to the plan that is applicable to a particular case, and the success with which it is executed; the latter to the successful imitation of nature, as well in the form and proportions of the teeth, as in the shape and expression of the mouth.

Artificial teeth, or back ones, or blocks as they are called, are sometimes made of sea-horse bone, but of late mineral teeth have been introduced, under the first patronage, called also, incorrodible enamelled, silicious, or terro-metallic teeth. These incorrodible enamelled teeth, gums and blocks are of such beauty, and durability, as far to exceed the hippopotamus ivory; and should be used in all possible cases, as they never decompose, lose their colour, or render the artificial the least tainted, or sour, which is the case in many pieces constructed on the old plan of ivory blocks. Thus a set made throughout with this elegant preparation, with their gums coloured exactly to represent nature, never alter in appearance; they have been brought to a high degree of perfection and give general satisfaction. The artist has attained, in the construction of them, to the making a gum of the natural colour also, so that where the gums are absorbed, the tooth or teeth are supplied with a coloured gum of the same material as the tooth; the colour is fixed, similar to the various shades of the teeth, so as to suit the patient's natural gums.

The extraction of the few teeth or roots, which may remain in the mouth is insisted upon by many dentists, previously to taking a model for the purpose of preparing artificial teeth. This is never necessary, as by my improved method of replacing the loss of teeth, from one to a complete set, I can fit the mouth in the most precise and accurate manner, so that every purpose of articulation and mastication, is answered, and the appearance is so truly natural as to be totally undiscoverable by any observer. I therefore would strongly urge those who require artificial teeth, never to submit to have any tooth or stump extracted for that purpose, for if only one tooth remain, or even a stump, it is of essential service in assisting to keep the artificial teeth steady in the mouth, and of great advantage in many other respects.

In order to be comfortable a false tooth must be set, as I have said, on a plate of bone or metal, previously adapted to the form of the gum, in the space where the tooth is wanting; or if a sound root remain the enamelled part of another must be pivoted upon it. This latter plan is applicable to all the front teeth, as far back as the third tooth from the centre of the mouth in the upper jaw, and when well executed, is capable of defying the closest scrutiny to detect the deception. But if the teeth are not well supported by the grinders, so as to prevent their collision with those opposed to them in the other jaw, which would shake and loosen them in their sockets, they soon drop out, like the front teeth of old people after the loss of their double teeth.

Ivory tusk and mineral paste having been employed, we may mention that natural teeth were used in most cases at one time before the introduction of the incorrodible mineral, which have entirely occupied their place. The enamelled portion of sea-horse bone was found to afford a few front teeth, then they were carved out, the tooth and gum being of one piece; but this plan is entirely abandoned, and it is well it is so, for they were destructive to the adjoining teeth, as they were tied to their necks with a silk ligature, and this irritated the gums. They could not be taken in in and out, the ligatures accumulated disagreeable matter around them, causing the breath to be affected thereby with a fetid odour, and the gums to recede from those teeth; so that they soon became loose, descending gradually from their sockets and ultimately falling out.

FIXING ARTIFICIAL TEETH, WHETHER A PARTIAL OR SINGLE OR A COMPLETE SET. There are two modes of fixing a single tooth, by engrafting or pivoting, and where there is no sound fang, mounting the tooth on a gold gum plate. One or other of the four front teeth, called the incisores, are those which require to be replaced; presuming then that we have a sound fang, an artificial tooth is selected, of the precise colour and size of the adjoining ones. A pivot of the finest gold, having been made spiral at its end, is neatly screwed into the false tooth, and this forms its pivot; then the root in the mouth being filed smooth and circular concave, as high in the gum as possible, the pivot of the pivoted tooth is inserted in the natural cavity previously prepared, so that when the false tooth is fixed the gum resumes its wonted place, and embraces it. When all the circumstances are favourable for pivotting, there is not a possibility of detecting the least appearance that any lost or diseased tooth has been replaced.

In cases where there are no fangs to which teeth can be pivoted, partial sets are resorted to. The tooth or teeth in these cases are mounted on a plate, and formed to fit and rest easily on the vacant space; and the artificial tooth being cut to the proper length of the others, the whole appearance is complete. Sometimes it is necessary to mount the tooth on a bone gum or to have the incorrodible gum teeth, and the reason why I will explain. In some cases the gum is so absorbed that the sea-horse bone or incorrodible gum teeth are made to assume the gum; for its being a thicker substance than a metal plate, and much lighter in proportion to its thickness, we avail ourselves of it. Having treated of pivoting or grafting a single tooth, we come to those cases requiring many teeth, called a partial set. There are other metals beside gold used to attach artificial teeth; but in those cases adapted for its application gold frames are, without doubt, the very best metal, and I would never recommend any other. The advantage of gold frames above other kinds, where the metal is pure and consequently unalloyed, is their not being susceptible of oxidization or discoloration from the effects of the chemical properties of the saliva, or from the effects of any of the condiments introduced or taken with our food, or from the effect of acid medicines. Gold is consequently in all cases to be preferred, being the most durable, and in the end the cheapest.

The metals on which dentists have sometimes mounted teeth (but I cannot say with satisfaction to themselves or economy to the patient), are palladium, silver, platina, or an alloy of gold. Each of these we will now treat of.

Palladium is a metal that has been recently introduced; it is a native and pure metal, though, in some cases, unfairly represented by dentists as white gold, when it has no similarity whatever to that metal: doubtless it is not likely to be acted upon by the saliva, nor is it subject to oxidization like silver. It is not so expensive as gold, but it is more so than silver, is very durable and a good substitute where less expensive frames than gold are insisted upon. The chief objection is its having the appearance of zinc or lead. Pure silver is another substance, and though it quickly tarnishes, can be kept bright by constant cleanliness. It is often used for cheapness, but no one having once had a gold frame, will a second time order a silver plate. It is very irritating to the gums, becomes offensive by its being acted upon by the saliva, and nothing can warrant its employment but where durability is not required, and cheapness is the only advantage sought. As to platina and semi-gold, they have nothing in them over gold to be desired or recommended.

There are various different ways adopted for fixing partial sets, by which whole sets, commonly called uppers and unders, are retained in their places; much difficulty presents itself here, yet it is easily overcome by those artists who have been regularly brought up to the business, and have served a seven years' apprenticeship to the mechanical branch. In this I find no difficulty; but the shifts *amateur dentists* are put to, at once show they are unfitted for the business. Some patients who come to me cannot get their partial set in or out, it being really tied in with a ligature called dentist's silk, a mode of fixing long exploded; some have come with them stuck in or rather wedged in, or with wire claws going round the adjoining teeth, and which are fully exposed to the sight.

Gutta percha has been lately attempted as an agent for fixing; it is at best a contrivance for sticking by its plastic nature to the gum, and as no living fibre or tissue like the gums will, for any length of time, allow a foreign substance to be stuck to them without creating a sore, it will not be found to answer the purpose. Any one conversant with the nature of gutta percha is aware that saliva or moisture, insinuating itself between it and the gums, immediately loosens and detaches it.

There is a manner of fixing teeth by what has been named the transverse palatine bar, which was first introduced in 1840, by my father, than whom no dentist from early and long experience, with a very extensive practice, was better able to suggest and introduce a new plan with success—particularly in those cases where all the upper back teeth are gone, the front ones remaining besides all those of the under jaw, and this is the state of the mouth, too common indeed, at from 35 to 55 years of age. As the result of the upper back teeth being gone, the unders very soon wear down the upper front incisors and canine, almost to a level with the gums. This gold transverse bar, passing across the roof of the mouth, is invisible, connects the two plates on either side on which the molars are mounted, and is quite out of the way of the tip of the tongue and the back of the necks of the front teeth, which is not the case when a plate indented and scolloped is brought round them. This kind of piece remains very firm, and there is no state of the mouth where false grinder teeth are required, for which the purposes of mastication are more perfectly met. Here I will select one case out of many to show this mode of fixing, and when it is desirable to recommend it, and for what state of the mouth it is to be applied.

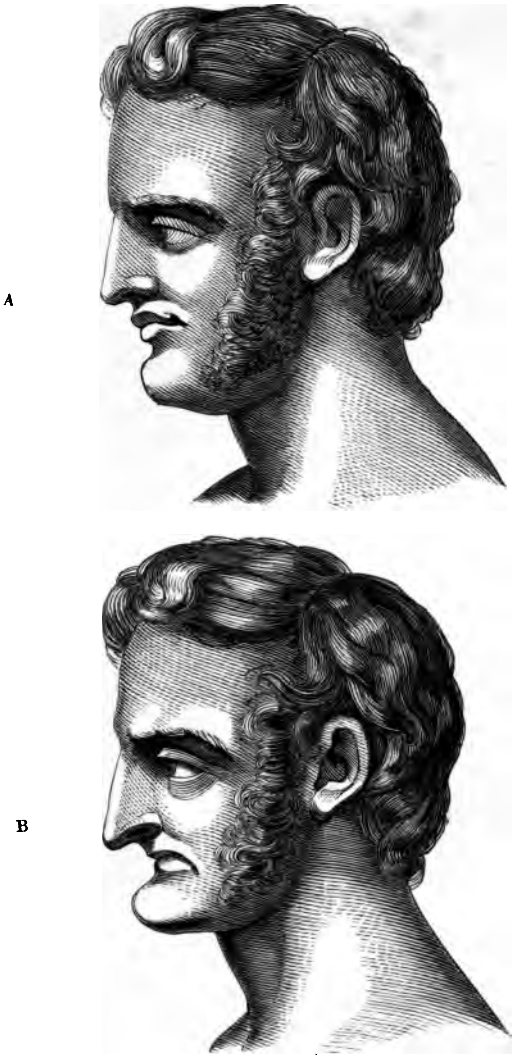
Case.—A gentleman 38 years of age, had lost all his upper molar teeth, and the side bicuspids; the complement of teeth in the under jaw was nearly complete; the upper front teeth were wearing fast away, from the absence of the grinders. As the front teeth of both jaws met perpendicularly, the friction was occasioning a chipping of the enamel of the incisors, and rapidly wearing them down, The place of the lost grinders was supplied by hippopotamus ivory teeth mounted, and fixed on the principle of the transverse bar; and now he has the complete use, of every part of his mouth, the front teeth do not meet, although they seem to do so, and consequently are not subject to further waste from attrition. It may be gratifying to learn, that these can be removed at pleasure, and not the least trace of art is visible when they are in the mouth.

The French have a way of mounting teeth, which mode, though not strong, is decidedly of much advantage. None of the mounting is seen, the teeth having a narrow groove made above their crowns, and a bar of gold let in, to which the teeth are fixed by the aid of small gold pins in a manner similar to that adopted by Messrs. Deserabode, Stevens, Delebarre and other Parisian dentists.

Whenever I can apply it, the mode of fixing which I invariably adopt, is that of self adhesion. This is only to be accomplished by the most perfect adaptation of the work, by making it fit closely to the gums, taking advantage of any bad teeth at the same time to receive a cap or a protective semicircular collar. And this I name partial self-adhesion. This mode refers to employment of metal, but when a sea-horse bone plate is used, it can be made to fit so air tight, as to be upheld and kept steadily in its place, by what is called capillary attraction, and atmospheric pressure; and this will give ease and comfort to the wearer. The artist must be capable of engraving his work so as to fit the gum perfectly air tight; and then it will adhere securely and firmly in its place for the purposes of mastication. The principles on which capillary attraction, and atmospheric pressure act, are well known—the former, as in the instance of the syphon, the latter, as in the instance of the cupping glass. When the air is exhausted, when two flattened surfaces come closely in contact so that no air can possibly insinuate itself between them, the pressure of the atmosphere is equal to fifteen pounds weight on every square inch. Advantage is taken of this to make gum plates, on which teeth are usually mounted to fit so accurately to the gums, that no air can get in, to lessen the adhesion, and where this is well accomplished there is no mode of maintaining teeth in their situation, with more comfort, and without any natural teeth adjoining sustaining the least injury. I am not aware that there are any other terms that can so well express the self-adhesive power, as those of capillary attraction and atmospheric pressure; for it is not always easy to find language sufficiently expressive. Hence it is that new discoveries seem to elicit a fresh nomenclature, or a discovery could not well be communicated from one person to another, and then a thing would be obliged to be seen to be understood; and thus it is to explain self-adhesion, we are obliged to use the terms atmospheric pressure, &c.

The union of sea-horse bone and gold is frequently required in making partial pieces; and the jarring of the front teeth on each other is obviated by preventing the mouth from shutting too close. In a month, or when a few weeks have familiarized the wearer to the change of anything in the mouth, he becomes almost unconscious that he uses artificial teeth. My great object is utility and comfort as much as appearance, though I never lose sight of the imitation of nature in the form, colour, and proportions of the teeth; taking especial care not to provide a too youthful sort of tooth, when intended for middle or older age, an error, which should be avoided, as it is apt to attract the attention of others to the mouth, when they see a remarkably fine row of teeth, which is unusual except in very young people.

A complete set of artificial teeth, presupposes the party requiring them to be advanced in years, and to possess healthy and sound gums, but no teeth whatever. The nose and chin are then observed almost to meet (See Plate), adding greatly to the age of the person, obstructing the speech, and causing mastication to be suspended; in fact the mouth is so crippled, that it is only with labour it can perform the least service; hence it is that in



A. With artificial teeth.

B. Without artificial teeth, shewing how the nose and chin approximate.

these cases dentistry is as indispensable as it is triumphant. Therefore, I shall dwell more on the supply of teeth in this case, than I have on the supplying a single tooth, or a partial set. Entire sets of teeth are worn with great ease and satisfaction, but some sets are so ill-made and unskilfully adapted, that they are troublesome to the wearer.

A WHOLE MINERAL SET composed of a kind of baked porcelain, covered with an enamel flux, with the gum coloured pink to imitate nature, all in one piece, has been attempted, but seldom can be made to answer; for in baking, the teeth lose so much of the shape given them when soft, as to become warped and much contracted. They are heavy in the mouth and not easily kept up in their places, occasion a noise unpleasant to the ear of the wearer, and are so unresisting and unyielding in every part, and so readily discernible in the mouth, that in the present day they are completely laid aside. One, two, or three in number, with gums, are the most that are now united and baked in one piece; and I find I can make them answer extremely well. As many as three I have fixed where there have been fangs to receive a pivot; when they are so few, any warping or shrinking from the heat they are subjected to, does not render them unfit to be worn, as is the case with a whole set made of this terrometallic substance. The objection to porcelain is, their not being easily altered like sea-horse bone gums with teeth, either mineral or natural mounted thereon. The basis or frame on which false teeth are set, when of hippopotamus, can be easily altered; it is sculptured and let down upon a plaster model of the defective parts of the jaws, and when of gold, upon metal casts of the same. Notwithstanding that the cast of the mouth has been taken by the most experienced dentist, he will frequently find that, when the frame comes to be tried in the mouth, it will press on some tender points here and there, which must be cut out or otherwise made to fit. Now if these were mineral frames, having been once formed, they must ever remain as they leave the oven, and there would be no way of relieving any part which might press upon a tender point, or cause a tightness or uneasiness. As plates of gold as well as of bone are used, I will explain why sometimes the one, and sometimes the other are to be adopted. When all the teeth of a person advanced in years are gone, the face becomes shorter by an inch or more, almost the entire length of two teeth as they meet in either jaw. (See plate, p. 18.) To restore the former length of such a face, if gold plates only be used, the false teeth must be fastened without cutting off any part of their roots, which would give an ugly appearance to the face. The teeth, from the absence of sockets and gums to conceal their roots, would have the appearance of a rail with wide spaces between. To obviate this latter inconvenience, the roots of false teeth are cut off when they are to be fastened on gold plates; which method it is obvious cannot wholly restore the original length of the face. Notwithstanding this, it is frequently adopted in toothless cases, and is generally, although erroneously, considered as an evil inseparable from the art.

For, although the teeth look natural enough, there is such an unnatural shortening of the face, and a falling in, with wrinkles of the cheek attending them, that any person, however regardless of fashion, would rather go without; but this inconvenience attending gold plates, where the teeth, together with their sockets, have altogether, or very much disappeared, is easily remedied by enamel gum teeth mounted on gold. The gold plates are put on casting metal models of the jaws, and stamped as we have stated, in partial pieces between a he and she die; plates of sea-horse bone are hollowed out with gravers and chisels, being worked on models of plaster, hardened by boiling in strong alum water, or by absorbing dissolved bees' wax before a fire. The process is as follows.

The model is painted over with a colouring matter, generally oil paint, to prevent its drying too soon; a block of sea-horse bone sufficiently large, is held horizontally over the model, the highest point of which it is made to touch, when the paint leaves a speck at every point of contact. Suppose, for a moment, the block to be of soft wax, which, if pressed home upon the plaster model would give the exact mould sought to be obtained in the sea-horse bone. These points are cut out with the graver, the block is again applied, and the same process gone through until the sea-horse bone presents an exact reverse of the model, and becomes in fact a mould of the jaw. To do this well is extremely tedious, although many dentists make short work of it, and apply the coloured points to the whetstone.

The success in affording comfort to the wearer of artificial teeth made in this way, and the price put on such work, are in general equally small; and will account for the advertisements which offer such things at less than half price.

To form a piece of sea-horse bone so as to sit easy in the mouth, and not spring up at one point when pressed on at another, is by no means easy; nor can it ever be done by an unskilful artist, however neatly he may execute the work. The sea-horse bone must be applied in a horizontal position to the plaster model every time, and at precisely the same points from first to last, otherwise it cannot be made to fit exactly. In some cases, (an under jaw for instance, having no grinders on either side,) one side may be much higher than the other, in consequence of the alveolar processes being less absorbed on that side than the other. To save trouble, some dentists would fit to such a model the block of sea-horse bone not horizontally, but at an angle, that would permit it to touch both sides of the jaw at once. On such a model, were one skilful and another unskilful dentist to form plates, the former would never permit the under surface of the bone to touch the model, but in a perfectly horizontal position; while the latter, although appearing to fit the model equally well, will find it spring up on one side, when pressed on the other. In consequence of which, no additional ingenuity can prevent inconvenience to the wearer, in the use of strong springs and clasps, now absolutely required to retain such teeth in their places; while the plate let down horizontally, and carefully hollowed out with more than double the labour, will sit firm and easy at every part, when pressed at any point, and without the use of springs. In this way plates of bone can be made to sit easy in any mouth without tying, and without extracting stumps or teeth that are firm, whatever be the shape of the jaw. In order to illustrate still further the causes of failure in constructing artificial teeth, suppose the under jaw of an elderly person, in which the front teeth only remain, and the artificial grinders are to be supplied in both sides of the mouth. They may be formed of one large block of sea-horse bone, as explained above, or of a separate small piece for each side united by a bar of gold, passing from one side to the other, behind the remaining front teeth. It has been shown that, in order to ensure comfort to the wearer of artificial teeth, both sides of the jaw must be formed of one solid piece of sea-horse bone. In this case, the part of the block which is intended to rest on the gum, between the remaining front teeth and the tongue, is reduced to a state nearly as thin as the bar of gold used to connect two small blocks. This is effected with a labour ten times as great as making the bar of gold. And yet the best dentists usually adopt the tedious and difficult process, in order to obtain a more comfortable fit to the wearer. This explains why artificial grinders, in the under jaw, having both sides united by a gold bar, can never be made to wear comfortably, owing to unskilful fitting, until at last, after much inconvenience, the gum has adapted itself to such a state of things; for no human ingenuity can set or join the opposite parts, or both sides together, by means of a bar, so perfectly as not to occasion injury to the wearer. Hence I carve the upper and under gum plates out of solid blocks of sea-horse bone, with the proper number of incisors and molars required; and these are kept up in their places by gold horizontal spiral springs, into the ends of which are passed what are technically called, moveable travellers, which I can safely recommend in preference to the grasshopper, or perpendicular spiral, which have at different times been introduced, I should say more for a change than from any advantage peculiar to them. Twice within the past year, such springs have been obliged to be changed for those I have mentioned. The grasshopper spring, however well it may be placed at the back of the mouth, at certain times of mastication will catch the cheek, or buccinator muscle, and pinch it, causing considerable pain and inconvenience; the other, the perpendicular spiral, is quite laid aside, and never was known to answer. Having in the foregoing pages set forth the different materials used for attaching or mounting teeth, I take the opportunity of stating the principles upon which my practice is founded, to ensure that professional confidence that it is my ambition to obtain. On all occasions of consultation, I candidly state what are the best materials to be used, and the most successful method to be pursued for comfort, utility and economy, not losing sight of durability or ornament. In some cases pivoting, or grafting teeth is superior to other modes; in some cases where the gums will not admit of pressure, capped or self-supporting frames are introduced; in other cases socketed frames, are attached for the support of loose teeth; in other cases I have recourse to the Continental or Parisian modes of adaptation. Where the closing of the teeth require it, I resort to an American plan, so that, it must be a very unusual case indeed, if one or other of the different modes cannot be brought in, to suit the difficulties or circumstances presenting.

It is necessary to observe strict cleanliness with artificial teeth, perhaps more than natural ones, or at least quite as much, by the use of proper tooth-brushes, morning and evening, with tepid water and tooth-powder. This will preserve them of a pearly whiteness, and retain them firm in their sockets; and at night time when taken out of the mouth, they should be placed in water. By such management they will last half as long again, and really so expensive an article as a complete set, should induce wearers to be careful, and bestow upon them ordinary preservative attention. There is one thing I particularly wish to notice, the little delay I occasion my patients betwixt the commencement and the completion of an order; for there have been great complaints about dentists keeping parties sometimes three weeks and a month in town, when it is supposed less time would have been sufficient to have completed the work. It occasionally happens in the treatment of some of the diseases of the mouth, that many weeks are required to effect the cure, and many circumstances will arise occasioning an unforeseen delay quite unavoidable.

We now dismiss the subject of supplying artificial teeth, observing that the different modes I have stated are sufficient for every conceivable loss of teeth. It may not be generally known that enormous sums of money are annually spent by all classes, [consequently the numbers are very great,] who are the wearers of artificial teeth. In short certain defective states of the mouth are an opprobrium, rendering a person's appearance objectionable; and there can be no reason, if they are worn for appearance, why in this there should be any feeling on the subject than obtains with other articles employed to embellish and set off the person. If, on the contrary they are worn for use, there can be no more objection to them than to glasses to preserve or assist the sight. Before proceeding to the functions of teeth, whether natural or artificial, under the head of mastication, I will treat here *of artificial palates.* Natural defects in the structure of the roof of the mouth occasionally occur. Only two cases have fallen under my treatment; and by the construction of a gold or silver plate which I contrived and fitted, extending over the roof of the mouth and adapted to its form, and capable of being removed at pleasure, all the purposes of a perfect palate are supplied, the aperture being stopped which affected the speech, and prevented the passage of food, particularly annoying by allowing liquids to pass through the nose, &c.

The most common instance of malformation is that of the palate bones being too much arched, a circumstance, however, which occasions no other inconvenience than an unpleasant roughness of the voice, especially in an attempt to sing. Sometimes there is a fissure in the bony structure of the palate; at others the velum pendulum palati, or soft palate, is defective; and occasionally, the deficiency extends to both. In these cases articulation is impeded, and much annoyance is felt from the passage of the food into the cavity of the nose. Imperfections of the ossa palati are more frequently a consequence of some affection of the gums and alveolar processes, from certain diseases, which, at one time or other, have attacked these bones. The extent of the mischief varies according to the causes which have produced it. Sometimes there is a considerable exfoliation of the palate, attended with the loss of several of the front teeth, together with their alveolar processes. At others there is merely a loss of substance of the palate bone from caries occasioning a fissure of greater or less extent. To remedy these defects, whether natural or incidental, is exclusively the province of the dentist; and such have been the improvements of modern times in the mechanical department of the dental art, that there are few cases of the kind to which a remedy cannot be applied with complete success.

THE HIPPOPOTAMUS, OR RIVER HORSE OF EGYPT. The hippopotamus is the amphibious animal which furnishes the bone or tusk dentists employ. It is known under the different names of river-horse, sea-horse; and the female as the sea-cow. From the tusk is procured an ivory more suited for artificial teeth and gums than the tooth of the elephant; for being of closer fibre it is less porous, consequently is more durable, not subject to turn yellow, and capable of a higher polish. These properties enable it to resist better than any other bony substitute the solvent effect of the saliva. The canine teeth or tusks are four in number; those brought to this country weigh from a pound to seven pounds. The older the animal the larger and harder is the tooth, they are so hard that they will strike fire with steel; these properties not only enhance its value, but occasion a competition to obtain the tusk of an older animal in preference to a young. A short account of this amphibious creature will not be uninteresting. The finest living specimen in Europe is to be seen at the Zoological Gardens, Regent's Park. His journey down the Nile had occupied more than five months, he was not then older than six months; he had been captured far up the Nile in 1849, but not without risk, and it appears there is a little history attached to his capture. A large female hippopotamus had been wounded, and was in full flight up the White Nile, about 1500 miles from

HIPPOPOTAMUS.

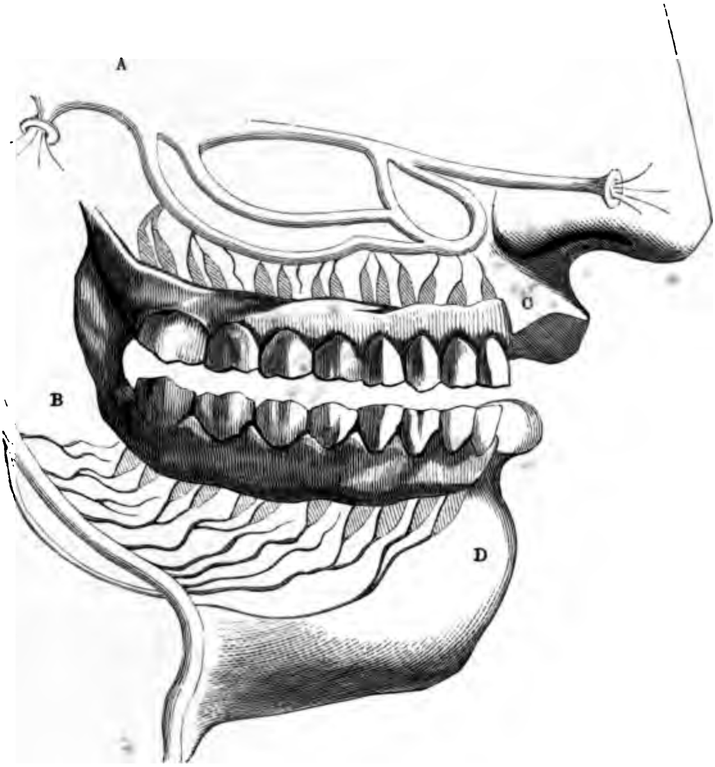
Cairo; her pursuers were close upon her track, and bullet after bullet whizzed by the terrified animal, until at last a ball or two reached a mortal part, and she paused. Maternal love made her stop; she fled no more, but turned aside and made towards a heap of brushwood and water-bushes that grew on the banks of the river, seeking that spot either to struggle for her life or die beside her young one. She could not reach it, her strength failed, she was unable to proceed so far, and sank dying beneath the water; but the action was so evident that her pursuers noticed it, and hastily proceeding to the clump they beat the bushes, and out rushed the young hippopotamus calf, plunging headlong down the river's bank. He would undoubtedly have cleared off, if a dexterous boatman had not thrust out his boat-hook, and with one blow buried it in our fat friend's flank. This secured him, and he was hauled on board. He was conveyed from Grand Cairo, in a cart nicely padded, to Alexandria, from whence he was embarked for Southampton; on the voyage he slept side by side with his keeper Hamet; to supply him with milk three cows and ten goats were taken on board for his sole use and service. We will now continue his natural history. At full growth these creatures are as large and not less formidable than the rhinoceros. They are inhabitants of the Nile and rivers of Nubia, and were formerly found in South Africa, but are now nearly extirpated at the Cape of Good Hope. They cannot move with any speed upon land; when alarmed they make to the river, plunge in head foremost, and dive to the bottom, possessing a power to move along as though they were on land in the open air. The female is of the mammalia, her young one is called a calf, which she suckles like a cow. In the river Nile the female has been seen with her calf on her back. The male has been known to arrive at a great size, and has been considered the behemoth of Job. This animal seems to have been well-known to the ancients, many were exhibited at Rome. Scorus possessed one of them, which he kept in a temporary lake, and Augustus produced one in his triumph over Cleopatra. The Egyptians revered it as a divinity, the flesh is eaten by the Africans. The males sometimes have terrible encounters with each other; being an herbaceous feeding animal, it is mild in disposition and gentle, but when under great provocation its power is dreadful; with its teeth it has been known to destroy boats, or upset them by raising them on its back. In figure the hippopotamus more resembles an unwieldy ox than any other animal. It used to be doubted if it could be tamed, but this point is set at rest by the one now being exhibited, which is remarkably mild, gentle, and playful with its keeper. Up to two years of age it lives principally on milk, after that it feeds entirely upon vegetable food, to provide which, it leaves the water and ranges along the banks. The lands about the Nile are subjected to its visits, by which whole fields of grain and sugar-cane are often destroyed.

For many ages no authentic history of the animal was obtained; the full size of it has been known to be seventeen feet, the height seven, and the circumference fifteen. The head three feet and a half, and the girth nine; the mouth about two feet wide; the ears small and pointed, lined very thickly within with fine short hairs; the eyes and nostrils small, the lips very thick, broad, and beset with a few small tufts of short bristles. The whole surface of the body is covered with short hair, very thin on under parts; the tail is short, not exceeding a foot in length, strongly compressed and almost naked, and marked by several strong circular wrinkles; the feet are large, being divided into four parts, each being furnished with a hoof, but, although the animal is amphibious, they are unconnected by any membrane or web. The hide is even thicker than that of the rhinoceros and of a dusky colour, but penetrable by a musket shot. Our friend Hamet, of the Zoological Gardens, says the one there will not have arrived at maturity for twelve or thirteen years to come, so that the prospect of its eventual size is positively alarming, if the words of our naturalists are to be relied on. Aristotle represents it as reaching the size of an ass. Herodotus affirms that in stature it is equal to the largest ox. Diodorus makes its height above seven feet, and Tacitus calls it, on account of its colour being similar and on account of its prodigious strength, the Egyptian elephant. The manners of the hippopotamus approach nearer to those of the hog than the horse, with which its name implies an affinity, for which reason Alpin calls them cheropotami or river hogs. They commonly sleep in the reedy islands in the middle of rivers, and, if possible, in situations surrounded by thick forests and deep impenetrable marshes. On being disturbed, they roll themselves into the river, and can walk about at the bottom of the water with as much ease as other quadrupeds do on land, rising to the surface every quarter-of-an-hour in order to breathe. In the waters which they inhabit they reign without a rival and without control. For further information respecting this singular animal. see Buffon's Natural History.

PART THE SECOND.

DENTITION AND THE STRUCTURE OF THE MOUTH, GUMS, TEETH, &c.

THE parts constituting the mouth, which in animals is the aperture which receives the food, are, the lips and common integuments, covering two large muscles, named buccinator and forming the cheek; certain elevating and depressing muscles, to raise and draw down the upper and under jaw; and then within, the soft and hard palate, the salivary glands, the tongue and the gums, which, though very vascular, are of a pale red or rather pinkish colour, forming an elastic fleshy hard substance that covers the alveolar arches, and closely embraces the necks of the teeth. The bones of the mouth are the two superior maxillary and two palatine, the lower jaw, and thirty-two teeth. The arteries of the external parts of the mouth are branches of the infra-orbital inferior alveolar, and facial; the arteries within the mouth are branches from the internal carotid. The veins empty themselves into the external jugulars; the nerves are branches from the fifth and seventh pair. The use of the mouth is for mastication, speech, respiration, deglutition, suction and taste, this sense arising from the gustatory nerve, which ramifies in minute branches, and spreads itself all over the tongue, terminating upon it in little papillæ. One of the most striking facts in the structure of all animals, is the relation of one part of their organization to every other. It was the discovery of this fact, that gave so much importance to the geological researches of Cuvier. He showed that it was not necessary, in order to know the structure and habits of an animal, that you should see either the living animal, or have even the whole of its remains. He pointed out that a certain structure of the foot required a particular condition of the leg, the pelvis, the spine, and thus on throughout the whole body. The practical value of these researches has been of the most decided kind in deciphering the history of the ancient world. Amongst the remains of animals which have been handed down to us in the greatest number, and the highest state of preservation, are the teeth. This has arisen from their dense structure more readily resisting the action of decomposing agencies than that of any other part of the body. This may be regarded as a fortunate incident for geology, as of all parts of the body the teeth are most decidedly distinctive of the character of the animal. The reason of this arises from the adaptation of the teeth to the peculiar food on which an animal lives; the nature of the food to a great extent influences the whole



This plate exhibits the nerves as they supply each tooth. An artery and an absorbent vessel accompany each nerve into the tooth, A and B. The nerves, which are branches from the fifth and seventh pair, C and D, show the branches from larger trunks as they enter the fangs of each tooth. Branches from the internal carotid arteries and jugular veins pursue the same course as the nerve, and enter the tooth with it.

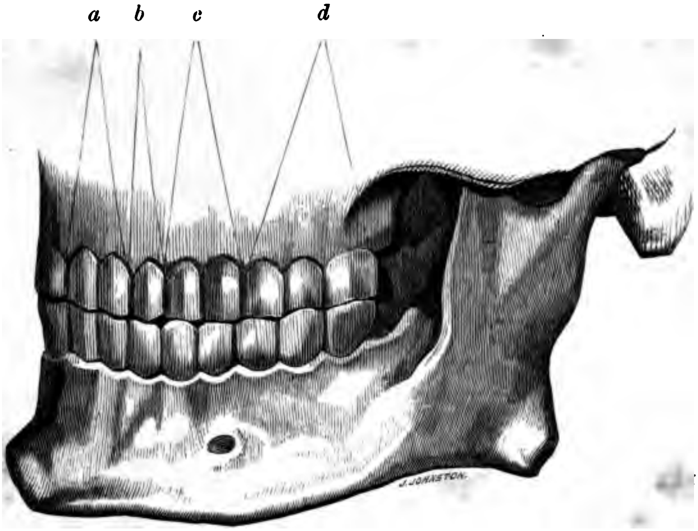
habits of the animal. How different must be the organization of creatures obliged to pursue living animals as their prey, from those which browse on the grass, or feed on the fruits of trees! But the teeth, being adapted to the food, the whole structure of the animal is at once suggested; thus single teeth of animals have been found, and the whole structure of the animals and their habits have been suggested by their examination.

It is to the teeth then that we wish now to draw attention, as organs connected with the preparation of food in men. The comparative anatomist distinguishes two kinds of teeth; for on examination of some of the lower animals, he finds that they possess organs which perform some of the same functions as, and have a similar structure to, those in higher animals, yet are of very dissimilar origin.

The teeth of man and the higher animals originate in the bone, in a part of their skeleton; but if we examine the teeth of fishes, we shall find that they do not arise from the skeleton, but from the membrane of the mouth. These are precisely of the same character as the spines seen on the scales of the back of some sharks and rays. These teeth then originate in a structure similar to the skin, and are called dermal or skin teeth; they are, however, occasionally very powerful organs, but they are used almost entirely as organs of *prehension;* they are not attached to a moveable bone, as is the case in the true teeth, and hence they cannot be used for the purpose of mastication.

If we examine the teeth of the human jaw (see plate) we shall find that they are representatives of the principal classes of teeth that we find developed in the lower animals. They are of three kinds, first, the large teeth behind, with broad flat surfaces, and which on account of their functions, are called grinders (*a*); they are technically named molars, or molar teeth. They are altogether twelve in number in the adult jaws, being three on each side of both upper and lower jaw; the last of these teeth are called wisdom teeth in man, from the fact that they do not appear till from the eighteenth to the thirtieth year of his age. These are followed on each side of both jaws, with two teeth whose surfaces are less broad, and which, having two sharp projections on each, are called *bicuspids*—two pointed (*b*). The sixth tooth on each side is called the *eye tooth* (*c*); it has but one point or projection, hence is called *cuspidate*—pointed. From its presence and large development in dogs, it has been called the *canine* tooth. Between these teeth on each side we have four teeth which have neither the broad surfaces of the grinders, nor the points of the *cuspidati;* but they are flat, having a sharp edge like a knife, hence they have been called INCISORS (*d*) or cutting teeth.

Now these three sets of teeth, which we may call grinders, tearers, and cutters, represent three classes of teeth amongst the lower animals. The grinders, which are evidently adapted to perform the operation which gives them their name, are found developed to the fullest extent in animals which live wholly upon an herbaceous diet; thus all the crea-



A lateral view of the whole series of the permanent teeth; showing the relative situation of those of the upper to those of the lower jaw.

a. The two front incisors.
b. The eye tooth.
c. The two bicuspids.
d. The three molars or grinders.

tures belonging to the family of the ruminantia, which includes such well known animals as the sheep and the ox, the antelope and the deer, are not only supplied with these teeth, but have them much more fully developed than the other teeth, which are, comparatively, of small size, and in some cases absent. The pachydermatous animals, to which the elephant, rhinoceros, and the hippopotamus belong, possess also these teeth of a very large size. In all cases they are employed to break down the coarser kinds of vegetable food before it is finally passed into the stomach for digestion.

The pointed teeth, or tearers, are found most perfect in those families of animals which prey on other animals and live on flesh. The most perfect exemplification of the nature of these teeth is found in the carnivora, the order to which the lion and tiger belong. In these creatures the eye tooth and bicuspids are very large, and their sharp points fully developed, and adapted to each other on opposite sides of the jaws, so as to serve at once as a powerful means of holding as well as tearing up their living prey. The grinders in these animals are also more or less pointed on their surface.

The front teeth—the incisors—are adapted for gnawing and cutting, and we find these teeth especially prominent in the family of rodents or rodentia. This family includes the hare and the rabbit, the rat and squirrel; they live chiefly on vegetable food, and this of a hard nature, some of them even eat wood; whilst such as the squirrels procure their food by piercing the hard coverings of the seeds of plants, as the various forms of nuts. Other families of animals have a mixture of these various kinds of teeth, according to their food.

Although the teeth form so prominent and distinguishing a feature of all the full-grown individuals, of the higher forms of animals, yet most of these animals, including man, are born without any teeth at all. When the child is born, the jaw is covered with gums, but underneath the gums are little cavities in which the teeth are formed; and as they continue growing, they at last press upon the gum, and causing it to absorb, finally break through it. This process is called dentition. It is frequently a source of disordered health to children, especially if anything occurs to prevent the absorbtion and ready yielding of the gum to the pressure of the tooth below. The absence of teeth during the period of human infancy, evidently indicates that the food required at that period does not need their employment. It is a well known fact, that the food of the infant is its mother's milk; but it is too often forgotten, that till teeth are developed, nature does not intend the child to take food that requires preparation by teeth in order to its digestion. The practice of feeding young children with solid food, is the cause of great destruction of life; and even sops should only be sparingly given, in cases of necessity, till the first teeth have appeared. From what I have before said, it will be seen that in the adult man, there are thirty-two teeth; but if we examine the jaw of a child after it has cut all its teeth, and before it is six years old, we shall find that it has but twenty teeth. Nor are these teeth increased in number by the addition of others; but whilst the first teeth are performing their duties, an entirely new set is growing underneath them, in precisely the same way as they did at first. Gradually the fangs of the first set of teeth are absorbed, in consequence of the pressure of those beneath, and they fall out, or are easily removed, and make way for others. The order in which the teeth appear, as well as the time is subject to considerable deviation. I think I am borne out, in stating, that man undergoes three dentitions: the first in which are cut twenty teeth; the second, when the twenty eight permanent teeth are being produced; and the third, when the four wisdom, or dentes sapientiæ appear. There is in all of these three dentitions more or less uneasiness, and I have often been obliged to lance the gums, for expediting the cutting of the wisdom teeth, just as in the first and second teething when the crowns cannot of themselves pierce through the hardened and callous enflamed gum. The following will be found to be about the periods when these changes in the mouth are supposed to occur, on the average, for they are found to vary, within a few months of the given time; for example, the wisdom teeth in some appear at eighteen, in others as late as twenty-five and thirty years of age—to so late a period have they been known to be delayed.

FIRST DENTITION OR MILK TEETH.

2 Lower Middle incisors . .	4th to 8th	months
2 Under ditto	4th to 8th	,,

4 Lateral Incisors	7th to 11th	month.
4 Anterior, or 1st Molars	12th to 18th	,,
4 Eye, or Canine Teeth	16th to 22nd	,,
4 Back Molars	19th to 28th	,,

20.

In some children, the whole of their first teeth may be cut by the end of the third year, whilst in others the progress of dentition may be prolonged to the fifth year; it has happened, but it is very unusual, for the completion of this first dentition to be delayed, as long as to the end of the sixth year.

SECOND DENTITION, OR ORDER OF APPEARANCE OF THE PERMANENT TEETH.

4 First Molars, one on each of the two sides of the Jaws	6th to 7th	year.
4 Middle Incisors, two in each jaw	7th to 8th	,,
4 Lateral Incisors, a little later than the last	7th to 8th	,,
4 First Bicuspids	8th to 9th	,,
4 Last Bicuspids	10th to 12th	,,
4 Eye, or Canine Teeth	11th to 13th	,,
4 Second Molars	12th to 14th	,,

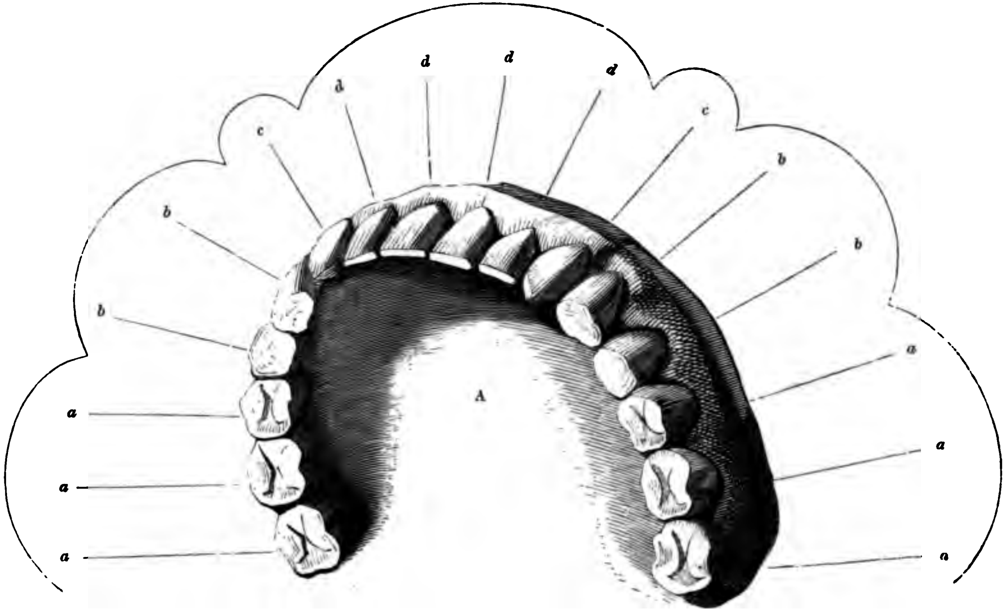
28.

THIRD DENTITION, OR CUTTING OF THE WISDOM TEETH.

4 Back Molars, or the Wisdom Teeth	18th to 30th	year.

32 in number.

The internal structure of the teeth is very com-



A. This diagram exhibits a full mouth of teeth of the upper jaw, and their names. The under jaw has precisely the same complement. The shape of the teeth differ in some degree, and the upper molares have three fangs, whilst the under ones have only two.

a. Grinders. *b.* Bicuspids. *c.* Eye tooth. *d.* Incisors.

plicated, and has recently formed the subject of profound research amongst the anatomists and physiologists of Europe. Their minute structure is found to be no less indicative of the species of animal to which they belong. We cannot go into the details of the dental structure of the lower animals, but all that possess true teeth exhibit the same facts as we find in man. If we make a vertical section of a tooth, with a fine saw, and after having polished it on a hard and smooth whetstone, submit it to an examination under the microscope, we shall easily make out the parts entering into the construction of teeth. We shall discover that there are three very distinct portions. First, the enamel, which covers the whole of the external part of the tooth; second, the dentine, this substance, which is so largely developed in the tusks of the elephant and other pachydermatous animals, constitutes ivory; third, the osseous matter or bone, forming the external covering or facing of the tooth. In the middle of the tooth, is the pulp cavity; into this cavity the nerves and blood-vessels of the tooth penetrate, and thus serve to maintain the living connexion between the tooth and the rest of the body. The distribution of the nerves into this cavity, will serve to explain how it is, that when any portion of the tooth becomes decayed so great pain is experienced. It will also indicate how it is, that, by the removal of a decayed part, and stopping it with some kind of cement, access to the air is prevented, and the danger of further decay removed.

Each hard part of the tooth is differently formed. The enamel is by far the hardest of these structures, and is composed of dense semi-transparent fibres placed side by side, and so small that they do not measure more than $\frac{1}{5000}$ part of an inch in diameter. These little fibres penetrate the dentine beneath. This substance is composed of two parts, viz., a number of very minute tubes anastomosing with each other, and an intertubular tissue. The tubes commence in the pulp cavity, and pass on to the outside of the tooth. The intertubular substance is composed of very minute white granules or globules. The cement which covers the outside of the fang, has a structure precisely like that of ordinary bone. These substances, are not always distributed in the teeth of the lower animals, as they are in man. In the gnawing animals for instance, the enamel is only on the front of the teeth, whilst the dentine is exposed on the back of the tooth. The consequence of this arrangement is, that the dentine wearing up much quicker than the enamel, the latter is always left with a sharp edge. Those who know the history of agricultural implements, will recollect that the very principal is involved here, which has been so succesfully applied to the making of ploughshares, by having one side of soft iron, and the other steel, and which has led to the formation of one of the largest manufacturing establishments in the east of England. The same principle is acted upon, in the formation of the elephant's tooth, in which plates of enamel are inserted crosswise through the teeth, and these are separated by dentine and cement. The more rapid wear of the dentine and cement keeps the enamel of the tooth constantly projecting, and thus secures a roughened surface for the more effectual trituration of the coarse food of these animals.

The teeth are inserted in, or rather developed out of the upper and lower jaws; the upper jaw is fixed, but the lower jaw has two round projections which are inserted into cavities in the skull, in which they move with great facility; this movement is different, in different animals. In those creatures which feed upon vegetable fibre, as it exists in the leaves and branches of plants, the jaw admits of a lateral motion, and the trituration and reduction of this kind of food, is thus insured. On the other hand, in animals which partake of food that requires no bruising before it is carried into the stomach, this lateral movement would be of no use; in the carnivora we find this action of the jaw confined to a simple up and down movement, by which the food is merely divided or cut into smaller pieces. When we examine the jaw of the human being, we find that it has a combination of these two movements, that it combines the rotatory action of the ruminant with the up and down movement of the carnivora.

OF MASTICATION.—Comminution or chewing of the food preparatory to its passing into the stomach, to undergo the solvent powers of the gastric juice, or, in other words, to be digested, is performed by the assistance of various motions, and consists of two very distinct actions, namely, biting or the separation of a portion of food by means of the incisors, and manducation or the grinding of the food by the molars.

The first of these actions is effected in the following manner:—the mouth being opened by depression of the lower jaw, the food is placed between the inferior and superior incisors, the edges of which are then brought in contact by the action of the elevators; whilst, at the same time, the condyles remain forward on the articular eminences, and, as the incisors are relatively longer than the other teeth, this contact of their edges is not accompanied by that of the surfaces of the molars. The elevators and retractors of the lower jaw are then thrown into strong action, by which the inferior incisors are pressed with great force against the superior; and being, at the same moment brought backwards and upwards, the portion of food is separated by exactly a similar action to that of cutting by a pair of shears. The portion of food, being thus separated by the incisors, is then carried by the tongue and the muscles of the lips and cheek, between the upper and lower molars on one side, the jaw being a little depressed for that purpose; whilst at the same time a certain degree of lateral motion is given to it, towards that side on which the food is placed, by the condyle of the opposite side being thrown forwards upon its articular eminence. The jaw is then brought forcibly upwards and the condyle at the same moment replaced in the glenoid cavity; a complicated movement of elevation and partial rotation being thus produced, the latter of which effects the bruising and laceration of the food. The position of the molars in the alveoli is admirably adapted to assist in this process, and at the same time to give them the greatest possible strength and security. Those of the upper jaw are situated with the crowns standing a little outwards towards the cheek; whilst the lower ones are placed in a contrary direction, so that their crowns hang over in some measure the inner alveolar plate. The consequence of this arrangement is, that when the surfaces of the upper and lower molars are brought into contact, by the double action of elevation and rotation, the direction of that movement is in accordance with the axis of the two rows of teeth applied against each other.

THE NATURAL FOOD OF MAN PHYSIOLOGICALLY CONSIDERED, DEDUCED FROM THE CHARACTER OF THE TEETH.

From the nature and offices of the different classes of the teeth, it appears that their structure and uses are more perfectly equalized in the human subject than any other animal. It is true that in some tribes of animals, whose habits require the greatest possible extension of the office of a particular class of teeth, a corresponding development of that class is found to take place, to a much greater degree than in man. Thus in the carnivora, the cuspidati are greatly elongated and strengthened, in order to enable them to seize their food, and to tear it in pieces; in the rodentia, or gnawing animals, as in the beaver for instance, the incisors are remarkably long, and exhibit that extraordinary development which their peculiar habits demand; and, in the graminivorous animals, the ruminantia especially, the molars are found to occupy the most conspicuous situation. But in each of these instances, the other kinds of teeth are found to be proportionally of less importance, and in some cases are actually wanting. In man on the contrary, every class appears to be equally developed, to a moderate, though a sufficient, degree, and to exhibit a perfection of structure, which may be considered as the true type from which all other forms are mere deviations. It becomes therefore a question of some interest, and perhaps of no less difficulty, to what food the structure which has just been demonstrated is particularly adapted. The opinion which I venture to give has not been hastily formed, nor without sufficient grounds. The endowment of our reason, the greatest and best gift of the Creator, appears, if we consider the perfection of our human structure to be particularly adapted to the conformation and requirements of man. This high and divine endowment should never be lost sight of in our reasonings on the human structure, and the physiology and habits of our species; as it is only with the allowances and modifications, which the possession of a quality so infinitely higher than the instinct of animals necessarily supposes, that the actual habits of man can be viewed as compatible with his organization. Although these habits, now essentially arising from a state of civilization, which in a greater or less degree, must be allowed to exist in every known tribe of our species, cannot be considered, in any one instance, as actually and exclusively natural; yet, by a careful examination of the structure of the different organs, and by an anological comparison of them as they exist in man, with the same organs in those animals which most nearly resemble him in structure, but which are still found in a perfectly natural state, we may be led to a plausible supposition, at least, of what were originally his natural habits, and which would have still continued so, but for those changes which have arisen from the possession of this endowment.

With this view of the subject it is not going too far to say, that every fact connected with the human organization goes to prove, that man was originally formed a frugivorous animal, and, therefore, probably tropical, or nearly so, with regard to his geographical situation. This opinion is principally derived from the formation of his teeth and digestive organs, as well as from the character of his skin, and the general structure of his limbs. It will not be necessary to go further into this subject, than to observe, that if analogy be allowed to have any weight in the argument, it is wholly on that side of the question which I have just taken.

Those animals, whose teeth and digestive organs most nearly resemble our own, namely, apes and monkeys, are undoubtedly frugivorous; but as, from their organization they are necessarily tropical animals, without the gift of reason, by which they might have overcome the difference of temperature by artificial means, they remain still restricted to their original food, and confined to the very limited climate to which their structure peculiarly adapted them. The reasoning powers of man on the contrary, have enabled him to set climate at defiance; and have rendered him, more or less, an artificial being. No longer restrained within that range of temperature to which the delicacy of his frame, no less than the nature of his original nutriment would have confined him, he becomes cosmopolite and fit for any climate.

There is a society of vegetarians, and it appears that their system of diet has been attended with no diminution of vigour or health. On the contrary, many have derived benefit from following a regime of this kind; and this society amounts to a very considerable number. We are informed the temper is very much more under control, and a greater harmony of feeling felt in those who have long restricted themselves to this mode of living. It is well known that Lord Byron, the poet, possessed a notion that animal food must needs cause a ferocity of disposition. Hence he remarked on seeing a guest partake abundantly of some meat; "permit me to remove a little distance from you, for surely, if I should offend you, I should fear you would feel ferocious and attack me."

PREHENSION. Among the organs which are employed for the act of procuring and reaching food, and collecting it to supply the mouth, are those of prehension. In man this office is performed by the hand, and arm more especially, but amongst the lower animals we find various substitutes for this very distinguishing feature of man's economy. In the elephant for example, the trunk signally performs this duty of a hand; the lowest creatures, such as the polypes have tentacles covered with cilia which give power to these organs as as agents of prehension. In the molusca we likewise meet with appendages round the mouth of the animal, by which food is grasped, previous to its being introduced into the stomach; these organs are more developed in the nautilus, argonaut and cuttle fish. Here the tentacles are powerful in enabling their possessors to secure for food, animals higher in organization than themselves. In the articulate animals, as worms, insects, crabs, lobsters and spiders, the hard external skeleton of the animal assumes various forms, to facilitate the taking of prey, and the conveying it to the mouth. The segments of the skeleton, forming the jaws are furnished with additional organs for this purpose, and in the nippers of the crabs and lobsters, we have a remarkable example of the adaptation of the fore feet to the need of the animal for holding powerful prey.

From the invertebrate, we pass to the vertebrate animals; and here we meet with the fish using its mouth for this purpose. The mouth of the fish is supplied with teeth, but they are not used in the same way as the teeth of man, but as organs of prehension. It is by means of the teeth, that the fish holds its prey when it is seized, previous to swallowing.

In the carnivorous reptiles, we find the same arrangement; and the dreaded teeth of the crocodile are not organs of mastication but prehension. In birds, the tooth of the fish and the crocodile is modified into a beak or bill, the object of which is to pick up food, previous to its being conveyed into the gizzard. Amongst some of the birds, especially the tribe to which the parrot belongs, the foot and claw are used as assistance to the bill in performing this office. In the mammalia we find very curious adaptations of particular structures to this function. In most instances, the teeth and jaws are the only instruments.

In the carnivora, however, the legs and paws of both fore and hind feet are used in seizing and securing prey. In the monkies we find the nearest approach to the human hand, wanting however, in that wonderful completeness which is given by the opposeable thumb; they use also the fore and hind feet alike for the purpose of seizing and conveying food to their mouth. In some animals, an elongation of the upper lip serves the purposes of prehension, as in the giraffe, and in many of the deer tribe.

An elongation of the nose is frequently likewise used for prehension amongst the pachyderms; and we cannot fail to observe that the tapir is a transition from the hog to the elephant, in which last the adaptation of this organ to the function of prehension in the form of its trunk, as we have stated, is most perfect.

I have dwelt on this subject longer than I otherwise should, from knowing that it is *a priori*, the general idea, that the use of teeth necessarily implies mastication; notwithstanding the opportunity presented to every one, of observing the manner in which the canine species take their food, that they never masticate; they will tear and gnaw hard substances simply for dividing them, to facilitate the swallowing: therefore, in this familiar instance, we are shown that their teeth are employed prehensively. With ourselves, thorough mastication is required, and the more the food is minutely commuted, the more is the saliva encouraged, and the pabula in the mouth being mixed with it, it is in a better state of preparation for the action of the gastric juice of the stomach; so far rendering the digesting of the aliment of man much easier, proving that his teeth are for mastication and not solely for prehension.

PART THE THIRD.

MANAGEMENT OF THE TEETH, DISEASES AND THEIR CURE.

INFANTS and children's teeth naturally first present themselves for our management and regulation. The incisors, or the milk teeth, usually cut their way through the gum, unattended with uneasiness or swelling; not so the others, and when the gum or gums are found florid and swollen, and the infant greatly disturbed, showing symptoms of convulsions, it is because the offending tooth or teeth cannot cut or pierce the way through. The dentist then lances or scarifies the gum; much blood should follow; hence the gum lancet should make several deep incisions. Often the gum over the same tooth will have to be lanced twice or thrice in a week; and the infant if placed on the lap, on its back, is in the best position for the operator, who is to avail himself of the infant's crying, for its mouth is then widely opened and presents a favourable opportunity, such as surgeons avail themselves of in releasing the tongue of an infant when it is tongue-tied.

Young mothers will find, and it is proper they should know, that teeth, as they are cut, whether in the infant or child, will have each cutting attended either with cough or a derangement of the bowels, either of which goes off, as the tooth appears. It is common to hear parents say one child cut its teeth with cough, another with diarrhœa, another with convulsions. In the last case, when no relief is found on incising the gum, it is expedient to call in medical advice, when, doubtless, one or two leeches will be placed on the back of the infant's hand, which should be immersed in warm water, to encourage the bleeding; and a hot bath may be found advisable.

The regulation of children's teeth is often requisite to prevent their being too crowded; but rarely in the first set is anything required to be done. It is during the second dentition, from the age of eight to sixteen, that they should be carefully looked after, to ensure their regularity and to obviate a disposition to crowd together and force one over another out of their proper places, so that the incisors may be seen overlapping and the eye teeth protruding on each side of the mouth in a very unsightly manner. To enable the eye teeth to take their right position, a bicuspid or a first or second molar should be removed, but before the age of fourteen, for it is not found to answer so well if deferred to a later period. The object of the dentist is ever to preserve the eye teeth and to train them in their places, as they contain within them the four incisors; protect them, and according to the regularity of these, will be the symmetry and beauty of the mouth. I have had occasion to cause a regulating plate to be worn about the upper teeth, to train some of them outwards and others inwards, so as ultimately to encourage them to form the natural segment of a circle; these endeavours are not unattended with difficulty, more on account of young people being impatient and averse to retaining any foreign substance in their mouths, than from any other cause.

Case.—The young gentleman was fifteen; I found his two eye teeth thrust out of their places by the lateral incisors and bicuspids on either side. It was imperative immediately to remove a bicuspid on each side; finding on one side the first molar diseased, I removed that. In two years after the youth was brought to me, the eye teeth had arrived at their proper places, the incisors were no longer pressed upon, the lapping over of them was entirely removed, and the gaps from whence the teeth had been taken, were almost closed; had the operation been delayed, its success would have been doubtful, for fourteen is as late as should be, to insure a certainty of remedying the defect.

The preservation now follows upon their completion. The mouth having its full complement of teeth, sixteen in each jaw, making the thirty-two, they should be cleaned every night and morning by the aid of a soft and hard brush, and with one or other of the simple dentifrices named under that head. The brushes should be used rather roughly about the necks of the teeth and the top of them, and if the gums are made to bleed it is rather of service than otherwise. Nothing containing anything acid, sweet, or gritty should be used. Of late years camphor has rather fallen into disuse, as having a chemically solvent effect on the enamel of the teeth; I am inclined to admit that there is some truth in it, and have ceased to introduce it into any tooth powders or lotions, unless requested by those patients who have a contrary notion of the properties of camphor. Certain roots, by separating the fibres at their ends, to form a sort of brush, are useful to insinuate between the teeth, to remove any particles of food that during the day have got impacted and fixed between them. Some tooth brushes are provided at one of their ends with merely some bristles protruding for this purpose. I much prefer banana roots, and I find they are generally preferred; and having an aromatic virtue and being less hard than bristle, they are more agreeable and pleasant to the gums.

Things taken very hot, such as tea, coffee, or soups, or any solids, they mechanically injure; expand the substructure of the tooth, and the enamel not accommodating itself so readily to this expansion, becomes brittle, and I have known a tooth to be cracked all over like to the appearance of the highly varnished surface of a globed map, but still undetached; no doubt, it is because hot things are among the luxuries indulged in by civilization, that the less civilized nations preserve their teeth in a sound state a much longer time. Hot preserved fruits, which are sweet and acid at the same time, are very bad; the hot sweet acidity, touching the necks of the teeth, leaves a sensation very unpleasant, therefore the mouth should be rinsed with lukewarm water always after having partaken of them. Of tobacco or mercury I need say little, for the abuse of either, it is too well known, is attended with great injury and destruction.

As regards the preservation of the teeth, there are two ages, eighteen and twenty-two, when there will be found an accumulation of a calculous nature, called tartar, deposited about the necks of the under teeth particularly. The removing of this is called scaling the teeth. There is no solvent that should be employed, because it would injure the tooth before it would accomplish the other object; therefore it must be mechanically removed at those two periods of life I have mentioned, and at a later period also if required. There is no pain attending this, but if there is a choice of time in which it is to be done, a warm season is best chosen, for the tartar being removed, the teeth have lost a kind of coating or diseased accumulation, which at first they might miss, if the weather was very cold.

PASTE TO CLEAN ARTIFICIAL TEETH, AND HOW TO PRESERVE THEM. The teeth should be taken out at least once in twenty-four hours, and well cleansed with a soft brush with the paste prepared for this purpose. At night (if it is usual to take them out) throw them into cold water and leave them till the morning; care should be taken to handle them gently, for being out of the mouth, they are easily warped, hence some people partly clean them in the mouth; by proper attention and care some preserve them two and three years longer than others who are negligent.

TOOTH POWDERS. Many compositions have been introduced under various names and titles, some retaining a merited reputation, others falling into disuse, from possessing certain qualities, either gritty, acid or sweet, or from being of a colour, like prepared charcoal, which being black, after long use, gives the teeth a darkish hue, and moreover is very dirty about a toilet. The preparation I recommend, which I shall name for distinction, preservative tooth powder, is composed of only two simple ingredients, pulverized into an impalpable state, very cleansing, antiseptic, slightly astringent and aromatic, and free from all gritty substances; it is kept in small bottles, better to preserve its violet odour, and the bottle is provided with a wide neck, for the greater facility of using it. My chemist informs me, it is the best preservative, and the least injurious of any dentifrice he ever had to compound, for it keeps the teeth of a fine pearly white, and retains them firm in their sockets. A good tooth powder is of the utmost importance to the beauty and preservation of the teeth.

Cleansing paste, for artificial teeth and gum plates, is a different thing from dentifrices in general, and will be required by those who wear them, to keep them in a proper and nice state.

HOMŒOPATHIC TOOTH POWDER. Some of my patients being under this treatment, and others advocating this system of medicine of Hahnemann, which in its remedial agencies never sanctions a combination of two medicines, but requires those which are used, to be in their most pure, and simple form, and free from all fragrance or scents, this dentifrice is carefully made according to the homœopathic rules, and is not more approved for its simplicity than for its power of cleansing the teeth and keeping them of a good colour.

LOTIONS FOR THE GUMS. They are used mixed with a little water, and are made of weak spirits of wine, some with camphor, some with jesuits' bark and some with quinine; they are strengthening and antiseptic, forming a very purifying wash for the mouth. I have prepared at my chemist's two sorts, one with camphor, called camphor and bark lotion, the other quinine lotion.

Homœopathic lotion, I have also provided; this lotion, contains rhus toxicodendron of the materia medica of Hahnemann.

Of lotions it may be remarked generally, that they are intended to stimulate the parts to a new and more healthy action. In many cases Eau de Cologne may be used, sufficiently diluting it and then wetting the tooth brush with it, or rinsing the mouth. Placing artificial teeth, when taken out of a night, in Eau de Cologne and water, is to be recommended.

ESSENCE FOR TOOTH ACHE. Of all essences, tinctures, extracts or specifics, none have proved so suddenly to afford relief as toothache essence. A drop is placed on a piece of cotton and applied to the diseased tooth, or, the tip of a camel hair brush is dipped into the essence, and the painful part gently touched with it.

The diseases which usually come under the treatment of the dentist are, tartar, loose teeth, caries, toothache, gum boil, scorbutic gums, abscess of the antrum of highmore, and tic douloureux, &c.

TARTAR.—With the exception of decay there is nothing more destructive to the teeth, or more conducive to an unhealthy and disagreeable state of the mouth than the accumulation of the calcareous substance which it has been long the custom to designate by the name of tartar, but which has latterly, with more propriety, been denominated the salivary calculus, or deposit.

This salivary calculus forms more or less upon the teeth of all persons ; but its tendency to accumulate varies in different persons. In some the smallest attention to cleanliness is sufficient to keep the teeth free from it ; while in others the greatest care is necessary to prevent its accumulating. When it is first deposited, it is soft and easily removed; it is of a yellow kind of colour, and as it gradually becomes hard, its colour becomes dark brown or rather blackish. In course of time it becomes as hard as stone.

In most cases this deposit is very much influenced by the state of health, and more especially by any circumstance which excites the secretion of the saliva. Thus fevers of all kinds, complaints of the liver, stomach, &c., the use of mercury, excesses of the table, smoking, may be enumerated as exciting causes.

It appears to be a precipitation of the earthy salts and mucus contained in the saliva; its principal ingredient being phosphate of lime, which abounds in the fluid; it becomes hard by the decomposition of the animal matter. Those parts of the teeth being nearest to the orifices of the salivary ducts, are most subject to its accumulation, such as the external surface of the upper molars, and the internal surface of the lower incisors. When it has increased so much as to touch the gum, it produces ulceration, and a train of bad consequences follow, the gums seceding from this matter and becoming very tender. Tartar is also liable to collect wherever any inequality exists in the enamel of a tooth; therefore in all operations of filing, care should be taken that no roughness remains; for when the smallest quantity of tartar has become fixed on any part of a tooth, it will form a nucleus upon which it will continue to be deposited. It never forms upon those teeth which are used in mastication. The tartar generally clings to the necks of the teeth, and carries on its operations like an insidious enemy; insinuating itself under the loose edge of the gum, it gradually detaches it from the teeth, and by its irritation induces absorption of the alveolar processes, thus undermining and ejecting the teeth, which it has not the power like caries to destroy. For a time the accumulation of tartar will form a prop to the tooth; but when by accident it is deprived of this support, it must inevitably fall out. Sometimes several teeth together drop out in this way; anything which tends to vitiate or increase the flow of the saliva will occasion a greater disposition to the accumulation of tartar upon the teeth. When the tartar is in a soft state on the teeth, a moderately hard tooth-brush, and water should be used; but if not sufficient, a powder should be resorted to, taking care to select one that has no chemical action upon the enamel, avoiding acid powders. Different kinds of tooth-powder are recommended, they are endless in their varieties, but they should be finely powdered and of not too hard a quality.

When tartar has already accumulated and hardened upon the teeth, it should be removed by means of instruments. This operation is called scaling, and is of great importance for the preservation of the teeth. If there is any quantity of the tartar, it should be removed at different times, otherwise the teeth would be exposed too suddenly and made tender; an astringent lotion should be used in the interim, with an interval of about a week between each operation. The removal of the tartar should be commenced at the edge next to the gum, so that they may gradually regain their position and tone. If any soreness remain after the operation, the gums should be lanced, for the tartar will have caused them to be spongy and soft; and by letting the dark grumous blood out, they will be relieved, and by the use of a styptic-lotion will become hardened and healthy.

CASE.—This was a lady, rather advanced in years, whose under-teeth were completely embedded in tartar, so that not one of them could be distinguished; in fact, it was one concrete mass of earthy deposition, and layer after layer kept depositing until she would have been unable to close her mouth. To have removed it *en masse* would have brought all the teeth away with it, and therefore I proposed, by degrees removing it, allowing each tooth to become firm, ere I proceeded to take it from the next; and in the course of five weeks I had got it all away, and in three weeks more, the gums had assumed a healthy and hard state, so that within two months, a complete cure was effected.

LOOSE TEETH.—These are very common and found more generally among persons about the middle periods of life; especially those who have taken mercury, resided in India or other warm climates. Having given much time and attention to this particular department of dentistry, I have succeeded in applying a new principle for arresting this very prevalent and most destructive state of the gums and teeth; by which means, teeth that are very loose, and apparently likely to fall out of their sockets, may be rendered firm, and retained for many years. Even if there be only one or two loose teeth in the mouth, immediate attention should be paid to the case, otherwise they will aggravate the disease by increasing materially the irritation and consequent inflammation, and thereby most certainly cause the loss of many others. By resorting to proper methods, sufficiently early, the teeth and gums may be restored to health. The principal object is to prevent the disease extending, which, if unchecked, it will do, through the whole mouth, one tooth after another dropping out without any apparent disease in it. Some dentists fasten them with gold wire, others with dentist's silk, which is not to be recommended, as the firm tooth to which the loose ones are fastened soon becomes loosened as well; the best practice is to support the loose ones laterally by placing teeth where they are wanting or adjusting a frame with or without caps as the case may suggest.

Caries.—The entire substance of the teeth, except the enamel, being similar in its structure to other bones, is affected in a like manner by the various causes of inflammation, but being much more hard and compact, and not possessing the power of exfoliation (or separating the dead parts of bone from the living), the teeth cannot be renewed or restored by that process which effects the renewal or restoration of other bones. Hence inflammatory action in the teeth terminates sooner or later in their total destruction. There are two species of the disease termed caries, which we find distinguished among the older writers on this subject by the epithets humid and dry. Modern nosologists, however, have applied to the latter the term necrosis, signifying mortification. The difference between them is this: Caries, properly so called, is an affection of the bones analagous to ulceration in the soft parts. It implies diseased action and a loss of substance in the part attacked, which is thereby rendered softer and lighter but yet retains its vitality. In necrosis, which is precisely similar to gangrene, the portion of the bone is entirely deprived of life. Caries generally attacks bones of a spongy texture, and necrosis the more compact ones, in which the vital principle is weakest. However, the two frequently occur together in the same part, and caries often ends in necrosis. The first trace of caries is perceptible on the external surface of the bone underneath the enamel, and it invariably takes a direction towards the cavity. That direction is indicated by discolouration of the substance, which is greatest at the part where the disease commences, and becomes gradually less distinct as it approaches the inner surface. Sometimes the enamel may be perfect, and the decay, in its very earliest stage, appear as a brown spot through the semi-transparency of the former.

Every dentist, and I should imagine every casual observer, must have remarked that persons who have had their health much deranged for any length of time have their teeth in a bad state. This is particularly the case when that derangement has been connected with liver complaints; and probably the mercury administered for the latter may have contributed mainly to this effect. However, the same thing is also observed in dyspeptic subjects, and those of a constipated habit of body. It is surely not unnatural to suppose that, that morbid irritability of stomach, which extends its influence to the mucous membranes of the throat and mouth, covering the tongue with fur and causing various disagreeable tastes and sensations, should render the salivary and other secretions so acrid as to cause inflammation of the teeth. If we notice a person advanced in years, or even arrived at that most uncertain stage in the journey of life called "a certain age," whose teeth strike us as remarkably well preserved, who boasts that he has not a single decayed tooth and never had the toothache in his life, we shall almost invariably find that person to be of a hale constitution, and to have enjoyed through life such uninterrupted health as to have escaped altogether the assistance of the doctor. This, I say, will be found to be the rule, I do not pretend it is without exception. In short, I feel convinced that persons in delicate health, the nervous and hysterical, the hypochondriac and sedentary, the bilious and constipated, will as a general rule be found to have carious teeth. But while I maintain this position, I am not unmindful that external causes operate, perhaps yet more frequently, to produce this disease. These are no doubt injuries to the enamel and bony substance of the tooth, which may be occasioned in various ways. The most obvious of these is a fracture of a tooth by a blow, or fall, or other accident; these, however, can affect only the front teeth. A far more common cause of injury is the biting of hard substances during mastication, on which occasions we sometimes feel a shock through the whole jaw, which may convince us with what force the mechanical movements necessary to that process are performed; a shock of this kind is sufficient to chip the enamel, and although we know this to be the thickest on the grinding surfaces, still we know at the same time that there the greatest waste takes place; and if the piece of enamel thus displaced be not of the entire thickness, yet it will soon be worn through to the body of the tooth. This cavity will also become a receptacle for minute particles of food, which, undergoing decomposition, will probably shorten the process of destruction by their own action on the parts around them. There is still another source of great injury to the enamel, which is the foolish practice of cracking nuts, biting thread, &c.; indeed, some persons are so utterly regardless of the proper uses of their teeth, that they seem to look upon the mouth as intended for a vice or any instrument that they may chance to need, such practices cannot be sufficiently censured, and they will no doubt be sincerely regretted when the loss of the teeth is felt. Let the reader imagine a tooth completely hollowed out and rendered a mere shell by the action of caries, and he will perceive at once how easily such a tooth, though capable of retaining its place a long time, if it be so situated as to escape hard pressure, will be crushed to pieces by the force required to break a hard nutshell. It remains to mention one other cause of gradual but certain injury to the enamel, namely, the use of acids, both medicinally and in the shape of dentifrices and lotions. When we consider that the enamel consists principally of phosphate and carbonate of lime, it is evident that decomposition must be the consequence if we suffer acids to come in contact with it. The most powerful of these, we see, are capable of destroying it in a short time; the others, though they operate more slowly, will, like the drop of water which wears away the stone, ultimately produce the same effect. The tartar may be removed by mechanical means, and its accumulation prevented by proper and timely attention.

It has been remarked, that the upper teeth generally are more subject to decay than those of the under jaw. This circumstance has occupied the attention of various writers, and, of course, various conclusions have been come to respecting it. It seems to be a fault in investigators generally, that they aim at finding one single sufficing reason for that which may be naturally accounted for in several ways. Thus, some physiologists are inclined to ascribe the effect in question to the upper teeth being exposed, from their position, to the action of the morbid secretions of the nose and the antrum, during catarrhal and other affections. Others think that the lower teeth being more acted upon by the saliva, the solvent powers of that secretion prevent the particles of food from injuring them. I see no reason why both causes should not contribute to the same effect; the one operating detrimentally to the upper teeth, the other favourably to those of the under jaw. Again, it is found that the molares are more frequently decayed than the front teeth. This perhaps may be owing to two causes. First, they are much more used in the mastication of animal substances, for the knife and fork have rendered the office of the cutting teeth nearly a sinecure; they are therefore more apt to be injured in the manner before described, and also to be affected by particles of food retained between them and on their indented surface. Secondly, the front teeth, in addition to their difference of figure, have the advantage of more effectual brushing—they are more in sight—they are more easily cleansed—in short, their appearance is of more importance, and they are of more importance, and are more anxiously attended to. Thus they are defended from many external causes of decay, and the lower ones are seldom found to be carious; those of the upper jaw are, however, acted upon by some such internal causes as I have hinted at, and are often in a decayed state. One would think that abundant evidence of caries being attributable to various causes, some internal, and some external, may be found in the fact, that we see, on the one hand, persons of a delicate constitution and depraved habit with sound white teeth; and on the other, those of a robust frame and healthy functions, with teeth discoloured and decayed. Again, we may observe caries in the teeth of those who are most scrupulously attentive to cleanliness; and not in those of such as neglect the common means of preserving them. In the one case, then, the teeth are bad in spite of every care, and in the other, good in spite of every neglect. There is, in some instances, an hereditary disposition to caries in some families, the members of which enjoy good health. Again, it is commonly noticed, that teeth decay in pairs; or in other words, those that are formed and grow together, are simultaneously affected by disease, the other teeth remaining sound for a length of time afterwards. It is not irrational to suppose, that the cause of decay in these cases is in the defective formation of the teeth, arising from constitutional or local disorder during that process. As there appear to be various causes, constitutional, internal, and external, capable of producing caries and necrosis of the teeth, so there is a considerable diversity apparent in the nature and progress of these disorders. Sometimes the decay advances very slowly, and years may elapse before the tooth is gradually worn down to the fang; which may then remain for another long period in the same state, neither painful in itself, nor injurious to the neighbouring teeth. At other times, the crown is speedily destroyed, and the fang attacked by necrosis, it becomes a dead extraneous body, and by the irritation which, as such, it causes in the parts in contact with it, much mischief is occasioned, and its immediate extraction becomes imperatively necessary. In these cases, the sockets inflame, the gum becomes livid, an extremely unpleasant discharge takes place. Meanwhile the irritation causes absorption of the alveolar process, and the neighbouring teeth are loosened. It is a common opinion, that caries may be communicated from one tooth to another, and in practice many cases appear to confirm this notion, but others completely refute it; and the inference is, that this disease is modified, like every other, by circumstances which elude our scrutiny. I have known a caries to proceed from within out, like the larva of a maggot in the kernel of a nut eating its way through the shell, or like a worm in the bud, &c.

THE TOOTHACHE AND REMEDIES.—The three most common forms of toothache, are the carious toothache, the inflammatory toothache, and the nervous.

There are certain seasons, spring and autumn, when agues are prevalent, in which the extremely painful affection, toothache, occurs. Where it arises from caries, it consists properly in irritation of a denuded nerve. The proximate cause is an inflammation of the vascular membrane, which lines the cavity of the tooth, and is composed of vessels and nerves, which enter into the extremity of the fang. When it occurs in a tooth apparently sound, the inflammation will be found, not in the tooth, but the periosteum, or that membrane existing between the entire fang of the tooth, and the alveolar socket (see inflammatory toothache). From the intimate connexion existing between the fifth and seventh pair of nerves, an acute pain in the ear usually attends this kind of toothache, and the treatment differs from that in which a caries is the cause. Our object then, *where there is a caries*, is to prevent the exposure of the nerve, to any current of air; eating or drinking hot or cold things, or food touching the irritable membrane in mastication, will be felt most acutely. The pain frequently comes on suddenly, is lancinating, and darts through the head in the direction of the temple and ear. During the paroxysm, the patient is almost distracted with the intensity of the pain, prepared to submit to any remedy that promises any alleviation of the suffering; at other times it is what is called a gnawing pain, which, never ceasing, is insupportably agonizing, and prevents rest, or attending to any occupation whatever. There are three modes of treatment for abating the pain, or rendering the nerve insensible. Anodine may be used, such as liquid laudanum; or camphorated spirits or some of the essential oils, spirit of tar, or creosote, salvolatile and tincture of opium, may be dropped into the tooth; secondly, the nerve may be burnt by caustics, as the concentrated mineral acids, or nitrate of silver applied in the same way; thirdly, the nerve may be destroyed by means of the actual cautery, which is a hot wire applied to the carious part. No dressing for immediate relief has been found to assuage the throbbing, and ease the pain more than the essence I have named for distinction, Lukyn's essence for toothache.

INFLAMMATORY TOOTHACHE.—When the periosteum is highly inflamed, it may be discovered by the permanence of the pain and by the apparent soundness of the tooth, and other general marks of inflammation; the treatment here consists in the same means as are employed to abate inflammation in other parts, namely, by aperient medicine, topical blood letting, by scarification of the gums or by leeches, by putting on a small blister, or placing near the part, as on the neck or behind the ear, a cataplasm of mustard, and by the adoption of an antiphlogistic regime, &c.

NERVOUS TOOTHACHE is that, which occurs without any evident cause in the seat of the disease, and may be divided into the partial and sympathetic. By the first is understood, a general morbid sensibility of the teeth. This, as observed, is commonly the effect of frequent rubbing, thinning the enamel, by which they are liable to pain from the slightest impression or what is termed toothedge. It is very frequent in children from the use of acid fruits; and in adults from a course of mercury.

It is particularly severe at times in chewing. The treatment consists in ceasing to partake of any acids or sweets, inhaling the steam from warm water, and calomel flowers; or hops, and a course of chalybeate waters, will corroborate the delicate nervous system. The second species, or sympathetic, is often the attendant of stomach complaints; and whenever this can be judged of from inspection of the tongue, or an acquaintance with the patient's habit, an emetic will be the most successful remedy. If arising from gout, or rheumatism, anodynes given so as to excite disaphoresis will be highly useful. In pregnancy, however, this complaint, though sympathetic, requires to be treated as an inflammatory affection. If we have thus employed the palliative treatment but with not so much effect as could be desired, and we plainly distinguish a caried tooth to occasion all the suffering, extraction becomes at last the sole and sure remedy.

Rheumatic, gouty, and dyspeptic pains about the face and jaws come more under medical treatment; but with regard to those pains so common in the early stages of gestation, experience has led many to infer that sound teeth are seldom, if ever, affected by this cause; it is only the general stimulus, discovering a diseased tooth, or stump which perhaps had not been before observed. Gestation can never occasion caries, and to attribute the loss of sound teeth to the fulfilment of a function highly favourable to health, would be to place nature in contradiction to herself.

GUM BOIL AND REMEDIES.—One of the most frequent consequences of toothache is gum-boil, or the formation of an abscess in the vicinity of the diseased tooth. Its usual symptoms are pain, inflammation and swelling, proceeding to a certain extent, and enlarging the cheek, and sometimes the whole face. On the formation of matter, which may be hastened by the application of a roasted fig or onion, the tumour points, generally opposite the diseased tooth, and bursts betwixt the gum and tooth; for the most part, the matter discharged is of a disagreeable taste, but there is an alleviation of all the symptoms; this affection is most common in cold damp situations. The continuance of the discharge is then determined by the state of the part, and, where no caries exist, heals up like a common wound; but where the latter takes place, the same process is renewed, and either extraction of the tooth or exfoliation of the jaw becomes necessary to complete a cure. To promote the latter, should stimulant injections fail, as lime water or diluted spirits, tincture of myrrh, or bark, the parts are to be laid open by incision, and a free vent given to the discharge of the matter; a circumstance which, wherever confined or deep seated, requires particular attention. The constitutional treatment is here also of much importance, as such symptoms are frequently connected with a taint of habit, particularly of a scrofulous kind.

SCURVY AND REMEDY. — This disease known

under the term of scurvy of the gums, is denoted by their tendency to bleed on the slightest occasion, and by a discharge of matter from the union with the teeth and gum. It seems a peculiar affection of these parts, and occurring in the stoutest people, is often no way connected with any constitutional disease. Its progress is different in different persons; in some the whole teeth are loosened in three or four months, though in others this does not happen for years. From the gum the morbid softness extends to the socket, and then the teeth loosen; but what is remarkable, when the teeth are lost, there is no appearance of scurvy; the same state also occurs when mercury is pushed so far as to cause salivation. The best remedy for this disease is frequent scarification of the gums, to rid them of their blood, and to excite that healthy inflammation which produces a tendency to adhesion and natural hardness, and may be assisted by frequent washing the mouth out with astringent solutions. Perseverance in the use of my quinine lotion, will in general remove it.

ABSCESS OF ANTRUM MAXILLARE, OR OF HIGHMORE, AND REMEDY.— Another consequence of toothache is the formation of matter in the antrum maxillare, though this may be the effect of other causes. The symptoms that mark this affection are severe continued pain of the cheek for a considerable time before any apparent swelling, gradually diffusing itself over the surrounding parts, and terminating in a hard extensive tumour of the cheek; this tumour, in process of time, comes to be discharged, either by pointing at the cheek, procuring vent by the roots of the teeth, or at the nose. The first of these, however, is the most frequent termination. The cure of this affection whenever ascertained, consists in giving a free vent to the discharge, and that at the most dependent and convenient part, which is the situation of the last molar tooth; it is, therefore, to be extracted: and if no communication with the antrum, by the discharge of matter, then appears, the head of the patient being laid back on the knee of the dentist, a small trocar may be put up through the socket of the tooth till it meet no resistance, when a discharge will immediately follow its being withdrawn; and after the matter is removed the opening heals up.

Tic Douloureux.—This is a very formidable malady, and one causing extreme suffering; and where the cause is not to be attributed to the teeth, or is situated in other parts of the body, it requires the attendance and treatment of the first physicians and surgeons in the country. When it can be clearly shown to be occasioned by the diseased fangs of the teeth, then will the aid of the dentist be required.

Case.—A lady who who had suffered, spring and autumn, for three or four years with this painful malady, requested me to examine her mouth. I could detect no disease; the molar teeth were, apparently, quite sound; all I could do was to recommend an anodine lotion. She, nevertheless, persisted that the middle molar tooth, of the right side, occasioned it. I could not consent to extract it, not being able to discover any caries or inflammation of the gum, nor did tapping or jarring the tooth cause any sensation. She left me, and the following autumn paid me another visit, stating that her sufferings had again returned; she was certain the middle upper molar was the cause, and therefore requested me to extract it, when I found the largest of the three fangs was diseased; and here, most assuredly, was the manifest cause, for, after this, all pain ceased, and in a few months she called upon me to say she had had no return.

Case.—For many years a gentleman had suffered with tic douloreux in his face; here I suspected that a minute branch of the facial nerve, leading to some caried teeth, kept up the irritation which caused his extreme suffering. For three years he had medical advice without any kind of improvement; the lady of the above case recommended him to me; I found several caries in many of the teeth, the extraction of which he could not make up his mind to undergo. I at last proposed the removal of three of them under the effects of chloroform. In this way all the diseased teeth were removed and his sufferings ceased; he is now in the enjoyment of such health as he has not known for some years.

Tic douloureux is not always confined to the face, but other parts, with their nerves, are occasionally attacked by it, particularly after gun-shot wounds, or amputations; the Marquis of Anglesea has been much afflicted with it, and has suffered much from time to time, ever since he lost his leg at Waterloo.

Homœopathic treatment is said to afford much relief, with the medicines they employ, Belladonna, Platina, Arsenicum, China, Veratim, &c. In some melancholy instances the disease is utterly incurable. When a branch of the fifth pair of nerves is the seat, the pain is under the eye and shoots over the entire half of the face, and frequently into the orbit; then the operation is to cut down and divide the trunk of the nerve, which is performed by the surgeon, dentists seldom, if ever, being called upon to do it.

The operations the dentist has to perform are scaling, separating, extirpating incipient caries, incising after Fay's plan, scarifying, or lancing the gums, plugging or stopping, using chloroform, extracting, partial luxation, transplanting, &c.

SCALING.—When the tartar, or deposit round the teeth acquires consistency, scaling instruments are requisite to scrape it off; and it is highly necessary that this should be done, as it is of great value in their preservation. Many persons fear to apply to the dentist for this purpose, under an erroneous impression that they have to undergo some painful operation. This is not the case; if skilfully performed, the pain is so trifling as to be unworthy the regard of even the most sensitive. After the scaling, the teeth, when perfectly clean, will have an even, smooth surface, and consequently oppose no resistance to the easy play of the tip of the tongue, as it passes over them. The teeth require to be scaled in some persons more than others; besides the preservation of the gums and sockets, another advantage accrues from this practice, namely, that when the tartar is removed, the first commencement of disease is detected and can then be checked.

SEPARATING THE TEETH.—Files, as thin as paper, some blank on one side, are passed between the teeth; usually the front ones undergo this treatment, and if any require it more than others, they are the upper bicuspides. In separating, the file is to be so managed as in no case to pass through the enamel to the bone; the thickness of the enamel is sufficient on each tooth to admit an exceedingly thin file to cut its way through a layer of enamel without coming down to the bone of the tooth. There is no pain occasioned; nevertheless, there is rather a disagreeable sensation, which is greatly avoided if the file is wetted from time to time with warm water.

EXTIRPATING CARIES, AND FAY'S PLAN OF EXCISION.—A careful examination of the teeth is requisite with the aid of the speculum oris. Incipient caries sometimes are so shallow as to admit of being filed out; although, we have remarked, that in separating the teeth, we must not expose the bone, in these cases we may, to obliterate the caries, if it should have touched the bone ; but before doing this, it will be necessary to ascertain the depth of the disease, for if deep, it will be a tooth favourable for stopping. Where the crowns of the teeth are very far gone, Fay proposed incising the crown ; and he had separate instruments made for nipping off each tooth. He was for preserving the fangs, arguing, that they being retained, prevented the absorption of the gums and sockets, and that the mouth retained its form. The theory was plausible, and for a season met with encouragement, but we find that when an unsound tooth is nipped off, the stump is in a diseased state, no gum will grow over, and it keeps up an irritation, and often times a disagreeable discharge ; in fact, a fang without its crown, is an adventitious or foreign substance, retarding healthy gums, which are to be appreciated next to sound teeth.

SCARIFYING, OR LANCING GUMS.—When they are found in a florid and spungy state, the gum lancet should be very freely used to make them bleed, and warm water used to encourage it. When it is necessary to lance them, they bleed so readily, that very little pain attends the operation, for even a hard tooth-brush will often excite them to discharge freely, and then scarifying will not be required.

PLUGGING OR STOPPING, is to render a tooth artificially sound again. Hunter observes, that if the caried part, be perfectly removed, before it has arrived at the canal or cavity of the tooth, a stop is sometimes put to the further progress of the decay and the tooth saved. The cavity of the tooth should be carefully cleansed of all impurities, and every particle of moisture carefully removed, before we attempt to insert the gold-leaf plugging. I do not like tin-foil, fusible metal, succedaneums or cements, if the caries admits of the hollow being soundly plugged with gold, for with gold they may be preserved for many years, and I consider this one of the most important and useful operations that can be performed. There are cases doubtless, when succedaneum may be used, and that "white cement," which I have lately introduced, for stopping front teeth, a clear, white enamel cement, and which has attracted much attention. It is generally put into the cavity without arousing the nerve, and excludes cold, or particles of food, and finally it acquires the hardness and solidity of Carara marble.

SUCCEDANEUM is another composition for stopping hollow teeth; it was introduced a few years ago, and notwithstanding many objections to it has been much used up to the present day. It was spoken of as being superior to gold or any other material, but is, however, extremely injurious, consisting of an amalgamation, mercury with precipitate of silver, and it has the misfortune to turn very black; therefore, for molar teeth with large hollows it is a good stopping, but cannot be used to stop the front teeth on account of the objection above stated.

A cement, having the properties of the succedaneum to harden and to retain a white colour, has been the study of chemists and dentists in France, Germany, and England for many years; and I can recommend the cement bearing the name "white cement," as retaining its colour and quickly becoming hard.

CHLOROFORM.—The patient, in surgical operations, is frequently placed under its effects in our public hospitals, but not so frequently in private practice; when dentists use it, they prefer the patient's being attended by the family medical man, not more on account of his being supposed better acquainted with the habits and constitution, than as a safeguard in the event of its being attended with any bad symptoms or danger. I make a rule myself never to administer it unless it is upon an empty stomach, and I am very sure, were this generally observed, its effect would at all times be unattended with the slightest risk. The quantity of chloroform I administer is about a drachm on a piece of lint applied to the mouth and nose; and repose follows after talking and throwing the arms about, and other symptoms of restlessness.

EXTRACTION.—In this operation the two circumstances deserving attention are, first, the previous separation of the neck of the tooth from its connection with the gum, and secondly, the proper hold or rest obtained in order to act. If the key instrument is employed, by firmly and steadily turning it in one direction, the tooth instantly yields to the effect of this powerful lever, and two seconds of time only are required to do this, so that the patient cannot be said to be long under the operation.

The forceps is a very clean drawing instrument, and some of the single-fanged teeth could not well be extracted by any other; indeed, I prefer the forceps in most cases, and some dentists seldom draw with any other instrument.

Partial Luxation is a plan seldom practiced. It is as painful as a complete extraction; it is destroying the connection of the tooth with the socket by the operation of luxation, and then immediately replacing it. By this means the nerve is divided in two, and, not uniting again, the tooth is without a nerve, and, no branches spreading on its internal membrane, will not be longer liable to pain.

Transplanting of teeth was suggested by the celebrated John Hunter, and though never resorted to now, it may not be uninteresting to the reader to know something about it. Transplanting is chiefly confined to the incisors and canine, and in order to its success, several circumstances require attention in conducting the operation. The first is the sound state of the socket, and on this its whole success depends; secondly, the root of the diseased tooth must be unaffected by disease itself, hence it can never take place in case of a stump; thirdly, the mode of extracting the diseased tooth so as to prevent injury to the socket, should be in a perpendicular direction, or with the forceps. With respect to the last point, the tooth to be inserted should be somewhat smaller and shorter than that removed, and the shape of its root, the chief thing, should correspond as nearly as possible to that of the extracted one, though the root may be shortened a little with a file if too long, without any injury. The person from whom the tooth is taken should have passed fourteen, and not exceed twenty-four years of age, and the patient should never, if in our power, be above forty. The operation succeeds best when the extraction and insertion are performed together, though some allege that in this operation even a dead tooth has succeeded as well as one immediately removed and inserted. The gum should cover part of the enamel of the transplanted tooth, and, in inserting it, should be slightly pressed round it. The transplanted one must be secured to the neighbouring teeth by a ligature of dentist silk or fine waxed silk. In this state it is allowed to remain for twenty or thirty days, the part being washed occasionally with astringents, and a diet of a fluid nature being strictly enjoined. As soon as the tooth appears firm, the ligature is generally taken away; but for this there is no certain time, as a tooth will often fasten in eight or ten days, and at other times require some months. With some, the fever and pain that attends the operation is often very considerable, and requires the antiphlogistic regimen to be strictly put in practice. When the operation succeeds, the transplanted tooth has been known to continue sound and preserve its colour for twenty or thirty years, but, in general, according to the experience of most dentists, they decay in six or eight years, and are, therefore, but of very temporary ornament and use. Though, by this operation, we are clear no constitutional disease can be introduced, whatever has been alleged, yet at times, from the irritation attending it, a peculiar ulceration of the part itself or socket has taken place, the specific nature of which we are still unacquainted with; and as this ulceration has not resisted the usual remedies employed against the different constitutional diseases, which it was suspected to be, and frequently got well of itself, we are therefore warranted in the conclusion made. From the uncertain success of transplanting, and the injustice of requiring or inducing another to lose a tooth, and submit to the pain of extracting it, joined with the hazard of morbid consequences, which, though rare, occasionally ensue, instead of this operation the use of artificial teeth is now generally preferred; and such is the dexterity of modern mechanics, as to give the deception every appearance of reality, so that transplanting is seldom attempted in the present day.

In conclusion I take leave to assure my readers and patrons, that should this brief exposition of the principles of dentistry contribute to afford information, I shall feel fully rewarded; for whether it be for speech, mastication, or appearance, very numerous are the persons who have occasion to visit the dentist. Whoever reads attentively this essay will admit, that it is peculiarly characterized by truth, making the subject as plain and intelligible as possible; and will perceive that both surgical treatment, and mechanical improvement have advanced with other arts and sciences, and that consequently dental operations are now better understood than formerly. Artificial work is accomplished on the improved principles of wear and comfort, and without disappointment or failure. Hence dentistry has become a most certain and useful art; I dismiss the subject with the Latin quotation—Ars quæ omnibus proest.

EXPLANATION OF TECHNICAL TERMS.

Antrum Maxillare—A hollow within the cheek bone, situated above the middle upper molar tooth on each side.
Arteries—The pulsating vessels of the body. They throb in inflammatory gum boil and toothache.
Absorbed—Wasted or removed. Necks of the first set of teeth to make room for the second set, are said to be removed by absorption.
Alveolar Sockets contain the teeth.
Alveolar Processes are the gums.
Alloy—The uniting any two or more metals, as gold and silver, &c.
Amalgam—The union of any metal with mercury, such as tin and quicksilver, &c.
Alkaline—Soda, Potass, or Chalk.
Anteacids—Magnesia, which neutralizes acidity.
Antiseptic—Those lotions which containing bark, quinine, or camphor, prevent or retard putrefaction.
Abscess—Matter forming in a cavity or sack, as in gum boil, &c.
Aliment—Food, nutriment, support.
Buccinators—The muscles forming the cheek.
Bicuspids or Bicuspides are so called because they have two heads or points; they are the two teeth on either side of the canine.
Caries—Ulceration or process of decay in a tooth, first appearing in a dark speck, and when it has ulcerated down to the nerve of the tooth, then the most painful toothache sets in.
Cicatrix—The scar which is left on the closing of a wound.
Cuspids or Cuspidati—Teeth having only one point. They are called the canine, or dog, or eye-teeth.
Dog-teeth—The Cuspidati.
Dyspepsia—Indigestion.
Febrile—Feverish.
Hereditary—Received from our Parents, as certain diseases, Scrofula, Cancer, Gout, &c.
Homœopathy—A system of medicine introduced by a celebrated German, Dr. Hahnemann.

Hippopotamus—The amphibious river-horse of the Nile.

Incisors or Incisores—The four front teeth in each jaw, so called from incision, to cut like shears or scissors.

Ivory—That obtained of the tusk of the elephant and sea-horse.

Incorrodible Enamel Teeth and Gums—A modern and most beautiful factitious substance for false teeth and gums.

Incorrodible—Not subject to change, alter, soften, or decay.

Infantile—The age from birth up to five years.

Inflammation—Swelling heat and redness of the gums or face.

Maxillary Bones—The jaw-bones.

Membrane—A fine structure which lines the internal cavity of a tooth and on which the nerve, artery, vein, &c., are spread.

Molar or Molares—The grinders, from molare, to grind.

Morbid—A word used to express a diseased state of a part.

Muscle—What is commonly called flesh; it is the instrument of motion as in moving the jaws, &c.

Mastication—Chewing of food, &c.

Narcotic or Anodyne—Medicines, as opium, hops, camphor, which induce torpor or tranquilize a nerve and ease pain.

Nosologists—Writers who arrange diseases under different heads of genera and species.

Osseous—Bony, or bony matter.

Prehension—The action of organs to obtain and hold the food, to be conveyed to the mouth or stomach.

Periosteum—The membrane which covers the neck and fang of a tooth, and is common to both the tooth and the socket.

Palate—All the roof of the mouth; it is divided into the soft and hard palate, all the front being the hard, and the back part the soft.

Suppurate—A term used to denote the process by which matter is formed after inflammation.

Uvula—The small red part of the soft palate of a grape-like shape hanging down from the soft palate.

Viscera—The organs within the abdomen.

Zigoma—The cheek bones.

Zoology—Scientific treating upon animals and their natural history.

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